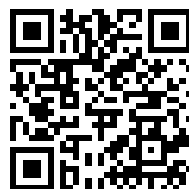


---

This is a reproduction of a library book that was digitized by Google as part of an ongoing effort to preserve the information in books and make it universally accessible.

Google<sup>TM</sup> books

<https://books.google.com>



**B** 339966

THE MEDITERRANEAN  
PILOT. VOL. III.  
FOURTH EDITION.  
1908.

# CAUTION WHEN APPROACHING BRITISH PORTS.

(To be inserted inside cover of all Sailing Directions.)

## PART I.—CLOSING OF PORTS.

(1) My Lords Commissioners of the Admiralty having taken into consideration the fact that it may be necessary to forbid all entrance to certain ports of the Empire, this is to give Notice that on approaching the shores of the United Kingdom, or any port of the British Empire, a sharp lookout should be kept for the signals described in the following paragraph, and for the vessels mentioned in paragraph (4), Part II., of this Notice, and the distinguishing and other signals made by them. In the event of such signals being displayed, the port should be approached with great caution, as it may be apprehended that obstructions may exist.

(2) If entrance to a port is prohibited, three *red* vertical lights by night, or three *red* vertical balls by day, will be exhibited in some conspicuous position in or near to its approach, which signals will also be shown by the vessels indicated in paragraph (4), Part II., of this Notice.

If these signals are displayed, vessels must either proceed to the position marked "Examination Anchorage" on the Admiralty Charts and anchor there, or keep the sea.

## PART II.—EXAMINATION SERVICE.

(3) Under certain circumstances, it may become necessary to take special measures to examine vessels desiring to enter the ports or localities at home or abroad, referred to in Notices to Mariners No. 1 of 1916 and subsequent years.

(4) In such case, vessels carrying the distinguishing flags or lights mentioned in paragraph (6) will be charged with the duty of examining ships which desire to enter the ports and of allotting positions in which they shall anchor. If Government vessels, or vessels belonging to the local port authority, are found patrolling in the offing, merchant vessels are advised to communicate with such vessels with a view to obtaining information as to the course on which they should approach the Examination Anchorage. Such communication will not be necessary in cases where the pilot on board has already received this information from the local authorities.

(5) As the institution of the Examination Service at any port will never be publicly advertised, especial care should be taken in approaching the ports, by day or night, to keep a sharp lookout for any vessel carrying the flags or lights mentioned in paragraph (6), and to be ready to "bring to" at once when hailed by her or warned by the firing of a gun or sound rocket.

In entering by night serious delay and risk will be avoided if four efficient all round lamps, two *red* and two *white*, are kept available for use.

(6) By day the distinguishing flags of the Examination Steamer will be a special flag (white and red horizontal surrounded by a blue border) and a blue ensign.

Also, three *red* vertical balls if the port is closed.

By night the steamer will carry : (a) Three *red* vertical lights if the port is closed ; (b) three *white* vertical lights if the port is open.

The above lights will be carried in addition to the ordinary navigation lights, and will show an unbroken light around the horizon.

(7) Masters are warned that, when approaching a British port where the Examination Service is in force, they must have the distinguishing signal of their vessel ready to hoist immediately the Examination Steamer makes the signal.

(8) Masters are warned that, before attempting to enter any of these ports when the Examination Service is in force, they must in their own interests strictly obey all instructions as to entry given to them by the Examination Steamer. In the absence of any instructions from the Examination Steamer they must proceed to the position marked "Examination Anchorage" on the Admiralty Charts, and anchor there, or keep the sea.

Whilst at anchor in the Examination Anchorage, Masters are warned that they must not lower any boats (except to avoid accident), communicate with the shore, work cables, move the ship, or permit anyone to leave the ship, without permission from the Examination Steamer.

(9) In case of fog, Masters of vessels are enjoined to use the utmost care, and the Examination Anchorage itself should be approached with caution.

(10) Merchant vessels when approaching British ports are specially cautioned against making use of private signals of any description, either by day or night, the use of them will render a vessel liable to be fired on.

(11) The pilots attached to the ports will be acquainted with the regulations to be followed.



(To face Cautionary Notice in all Sailing Directions.)

V K  
798  
.67

**NOTATIONS OF SUPPLEMENTS AND ANNUAL  
SUMMARIES OF NOTICES TO MARINERS  
RELATING TO THIS BOOK.**

To be filled in by Navigating Officer.

[In Chart Dépôts the two first columns are alone to be filled up.]

Title.	Date of Publication and Number.	Whether pasted in or noted in Margins of Book, and Date of each Correction.



# NOTICE.

---

## HYDROGRAPHIC DEPARTMENT, ADMIRALTY.

---

IN January of each year the information affecting this book, which has been published during the preceding year in the Admiralty Notices to Mariners, is compiled and issued as a separate publication. If a Supplement has been issued during the year, this publication will only include Notices issued since the date of the Supplement. Mariners are advised to procure copies of these publications. They can be obtained gratuitously from the Admiralty Agent or Sub-Agents for the sale of charts on presentation of the coupons on the next page, either personally or by letter. In the latter case the cost of postage must be enclosed.

The Supplements or Hydrographic Notices to this book which may be published can also be obtained in a similar manner on presentation of the coupons below.

A. M. F.

Supplement or Hydro-  
graphic Notice, No. 3, to  
MEDITERRANEAN PILOT,  
VOL. III. 1908.

Supplement or Hydro-  
graphic Notice, No. 2, to  
MEDITERRANEAN PILOT,  
VOL. III. 1908.

Supplement or Hydro-  
graphic Notice, No. 1, to  
MEDITERRANEAN PILOT,  
VOL. III. 1908.

# NOTICE.

## HYDROGRAPHIC DEPARTMENT, ADMIRALTY.

In January of each year the information affecting this book, which has been published during the preceding year in the Admiralty Notices to Mariners, is compiled and issued as a separate publication. If a Supplement has been issued during the year, this publication will only include Notices issued since the date of the Supplement. Mariners are advised to procure copies of these publications. They can be obtained gratuitously from the Admiralty Agent or Sub-Agent for the sale of charts on presentation of the coupons on the next page, either personally or by letter. In the latter case the cost of postage must be enclosed.

The Supplements or Hydrographic Notices to this book which may be published can also be obtained in a similar manner on presentation of the coupons below.

A. M. E.

Supplement or Hydrographic Notice No. 1 to Admiralty Notice No. 1, 1898.	Supplement or Hydrographic Notice No. 2 to Admiralty Notice No. 1, 1898.	Supplement or Hydrographic Notice No. 3 to Admiralty Notice No. 1, 1898.
--	--	--

(1898) W. 1873-1898, 1898-1898, T.G.E.

Summary of Notices to Mariners  
published during 1917, affecting  
MEDITERRANEAN PILOT, VOL. III. 1908.

Summary of Notices to Mariners  
published during 1912, affecting  
MEDITERRANEAN PILOT, VOL. III. 1908.

Summary of Notices to Mariners  
published during 1916, affecting  
MEDITERRANEAN PILOT, VOL. III. 1908.

Summary of Notices to Mariners  
published during 1911, affecting  
MEDITERRANEAN PILOT, VOL. III. 1908.

Summary of Notices to Mariners  
published during 1915, affecting  
MEDITERRANEAN PILOT, VOL. III. 1908.

Summary of Notices to Mariners  
published during 1910, affecting  
MEDITERRANEAN PILOT, VOL. III. 1908.

Summary of Notices to Mariners  
published during 1914, affecting  
MEDITERRANEAN PILOT, VOL. III. 1908.

Summary of Notices to Mariners  
published during 1909, affecting  
MEDITERRANEAN PILOT, VOL. III. 1908.

Summary of Notices to Mariners  
published during 1913, affecting  
MEDITERRANEAN PILOT, VOL. III. 1908.

Summary of Notices to Mariners  
published during 1908, affecting  
MEDITERRANEAN PILOT, VOL. III. 1908.

Summary of Notices to Mariners  
published during 1917 affecting  
Mediterranean Port Vol. III, 1908

Summary of Notices to Mariners  
published during 1918 affecting  
Mediterranean Port Vol. III, 1908

Summary of Notices to Mariners  
published during 1915 affecting  
Mediterranean Port Vol. III, 1908

Summary of Notices to Mariners  
published during 1911 affecting  
Mediterranean Port Vol. III, 1908

Summary of Notices to Mariners  
published during 1917 affecting  
Mediterranean Port Vol. III, 1908

Summary of Notices to Mariners  
published during 1917 affecting  
Mediterranean Port Vol. III, 1908

Summary of Notices to Mariners  
published during 1911 affecting  
Mediterranean Port Vol. III, 1908

Summary of Notices to Mariners  
published during 1915 affecting  
Mediterranean Port Vol. III, 1908

Summary of Notices to Mariners  
published during 1907 affecting  
Mediterranean Port Vol. III, 1908

Summary of Notices to Mariners  
published during 1905 affecting  
Mediterranean Port Vol. III, 1908

THE  
MEDITERRANEAN PILOT.

VOL. III.

COMPRISING

THE ADRIATIC SEA, IONIAN ISLANDS, THE  
COASTS OF ALBANIA AND GREECE  
TO CAPE MATAPAN.

ALSO

THE GULFS OF PATRAS AND CORINTH.

FOURTH EDITION.

*Compiled from various Sources.*

---

PUBLISHED BY ORDER OF THE LORDS COMMISSIONERS OF THE ADMIRALTY.

---

*Crown Copyright Reserved.*

LONDON:  
PRINTED FOR THE HYDROGRAPHIC OFFICE, ADMIRALTY,  
UNDER THE AUTHORITY OF HIS MAJESTY'S STATIONERY OFFICE,  
By TAYLOR, GARNETT, EVANS, & Co., LTD.,  
ALSO AT MANCHESTER AND REDDISH;  
AND SOLD BY  
J. D. POTTER, AGENT FOR THE SALE OF ADMIRALTY CHARTS,  
145, MINORIES, E.C.

1908.

*Price Four Shillings.*

20

# ADVERTISEMENT

TO

## FOURTH EDITION.

---

The Mediterranean Pilot, Vol. IV., contains sailing directions for the Adriatic sea, for the Ionian islands, and for the coasts of Albania and Greece as far as cape Matapan ; including the gulfs of Patras and Corinth.

The directions for the Adriatic sea were originally compiled by Captain M. S. Nolloth, R.N., chiefly from the following works :—viz., the journals of the late Captain Sir William Hoste, R.N. ; the *Novo Costiere de Mare Adriatico*, by Grubas, 1842 ; the *Portolano del Mare Adriatico*, by Marieni, 1845 ; a Memoir by Beautemps-Beaupré, in 1808-9, published in 1847 ; and, the *Manuel de la Navigation dans la Mer Adriatique* by Captain Le Gras, of the French Imperial Marine, 1858. These were published as the *Adriatic Pilot*, in 1861.

The directions for the coasts of Albania and Greece, as also for the Ionian islands, were compiled from the surveys of Captain A. L. Mansell, R.N., 1863-5 ; from the *Portolano del Grecia*, by Captain Páuer de Budahegy of the Austrian Imperial Navy, 1837 ; and from the Remark books of Officers of H.M. ships.

These directions were included in one volume, as the *Mediterranean Pilot*, Vol. III., in 1880, by Commander James Penn, R.N., late of the Hydrographic Department, Admiralty.

The second edition was prepared by Captain E. H. Hills, R.N., and the third by Captain J. J. P. Hitchfield, R.N. The present edition has been prepared by Captain John Phillips, R.N., and contains all the information available to date of publication. The coast eastward of cape Matapan will be found in Vol. IV.

With a view to the general interests of Navigation, seamen are invited to transmit to the Secretary of the Admiralty notices of errors or omissions they may detect in this work as well as any fresh information they may obtain.

By the publication of this book, all former editions as well as Hydrographic Notices, Supplements, and all Notices to Mariners, including No. 1118 of 1908, relating to former editions, are cancelled.

A. M. F.

HYDROGRAPHIC OFFICE, ADMIRALTY, LONDON,  
*July 1908.*

320111



# LIST OF WORDS OF FREQUENT OCCURRENCE IN MAPS, CHARTS, AND SAILING DIRECTIONS.

<i>Italian.</i>	<i>English.</i>	<i>Italian.</i>	<i>English.</i>
Acqua -	- Water.	Gavitello -	- Buoy.
Albero -	- Tree, mast.	Ghiaccio -	- Ice.
Allerta ! -	- Look out !	Ghiaja -	- Gravel.
Alto, a -	- High, lofty.	Girante -	- Revolving.
Ancoraggio -	- Anchorage.	Golfo -	- Gulf.
Arena -	- Sand.	Grande, gran -	- Great.
Argilla -	- Clay.	Guado -	- Ford.
		Guardiano -	- Health Officer.
Baia -	- Bay.		
Barra -	- Bar.	Imboccatura -	- Mouth of a river.
Bianco, a -	- White.	Isola -	- Island.
Braccio, di 6 piedi	Fathom.	Istmo -	- Isthmus.
Burrasca -	- Squall.		
		Lago, Laguna -	- Lake, lagoon.
Cala -	- Cove, creek.	Largo, a -	- Wide, broad.
Campanile -	- Belfry, tower.	Lume -	- Light.
Canale -	- Canal, channel.	— fisso -	- Fixed light.
Capo -	- Cape, headland.	— a folgori -	- Flashing light.
Carbone fossile -	- Coal.	— girante -	- Revolving light.
Chiesa -	- Church.	Luna -	- Moon.
Città -	- City.	Lungo, a -	- Long.
Colle -	- Hill.		
Corpo di guardia -	Guard-house.	Mare -	- Sea.
Corrente -	- Current.	Marea -	- Tide.
Corto, a -	- Short.	Mercato -	- Market place.
Costa -	- Coast, shore.	Molo -	- Mole, pier, jetty.
		Monte, montagna -	Hill, mountain.
Di dentro -	- Within, inner.	Mulino -	- Mill.
Di fuori -	- Without, outer.	Muro -	- Wall.
Dogana -	- Custom-house.		
		Nero, a -	- Black.
Erto, a -	- Steep.	Nuovo, a -	- New.
Fango -	- Mud.	Palude -	- Marsh, bog.
Faro, fenale -	Lighthouse.	Passo -	- Pass, channel.
Ferro -	- Iron.	Piano, a -	- Flat, level, low.
Ferro-via -	- Railroad.	Pianura -	- Plain.
Fisso, a -	- Fixed.	Piccolo, a -	- Little, small.
Fiume -	- River, stream.	Pietra -	- Stone, rock.
Fondo -	- Deep, bottom.	Piloto -	- Pilot.
Foresta -	- Forest.	Pioggia -	- Rain.
Forte, fortezza -	Fort, fortress.	Ponte -	- Bridge.
Fuoco -	- Fire, light.	Porta -	- Gate of a town.

<i>Italian.</i>	<i>English.</i>	<i>Italian.</i>	<i>English.</i>
Porto -	- Port, harbour.	Scogliera -	- Reef of rocks.
Posta delle lettere	Post-office.	Scoglio -	- Shoal, rock.
Posto -	- Post, station.	Secca -	- Shoal, bank.
Promontorio	- Promontory.	Segnale -	- Beacon, signal.
Punta -	- Point.	Selva -	- Forest.
		Sorgente -	- Spring.
Rada -	- Roadstead.	Stagione -	- Season, station.
Rio -	- River, channel.	Strado -	- Road, street.
Riva -	- Shore, coast.	Stretto -	- Strait, narrow.
Rosso, a -	- Red.		
Sabbia -	- Sand.	Terra -	- Land.
Santo, a -	- Saint, holy.	Torre -	- Tower.
Sale -	- Salt.		
Saline -	- Saltworks.	Valle -	- Valley.
Sanità -	- Health.	Vecchio -	- Old, ancient.
Sasso -	- Stone.	Vento -	- Wind.
Scala -	- Landing-place.	Verde -	- Green.
Scandaglio	- Sounding lead.	Villaggio -	- Village.
		Volcano -	- Volcano.

<i>La Rosa dei Venti.</i>	<i>The Points of the Compass.</i>	<i>La Rosa dei Venti.</i>	<i>The Points of the Compass.</i>
Tramontana -	North.	Mezzodi -	South.
Greco tramontana	North-north-east.	Mezzodi libeccio	South-south-west.
Greco -	North-east.	Libeccio -	South-west.
Greco levante -	East-north-east.	Ponente libeccio	West-south-west.
Levante -	East.	Ponente -	West.
Sirocco levante -	East-south-east.	Ponente maestro	West-north-west.
Sirocco -	South-east.	Maestro -	North-west.
Mezzodi sirocco	South-south-east.	Maestro tramontana.	North-north-west.
Mezzodi -	South.	Tramontana -	North.

## CONTENTS.

	Page
<hr/> CHAPTER I. <hr/>	
General information; Adriatic sea; coasts of Adriatic and Morea; soundings; islands; gulfs; communication; winds and weather, the Bora, &c.; currents; tides; navigation of the Adriatic .. ..	1-36
<hr/> CHAPTER II. <hr/>	
Cape Santa Maria di Leuca to Tronto river .. ..	37-64
<hr/> CHAPTER III. <hr/>	
Tronto river to port Buso .. ..	65-96
<hr/> CHAPTER IV. <hr/>	
Port Buso to Merlera point .. ..	97-127
<hr/> CHAPTER V. <hr/>	
Quarnero gulf and islands .. ..	128-167
<hr/> CHAPTER VI. <hr/>	
Coast of Dalmatia from abreast of the south-eastern end of Pago island to port Rogoznica .. ..	168-192
<hr/> CHAPTER VII. <hr/>	
Coast of Dalmatia from Planka point to Stagno Piccolo, and adjacent islands .. ..	193-222
<hr/> CHAPTER VIII. <hr/>	
Coast of Dalmatia from cape Gomena to the gulf of Cattaro, and adjacent islands .. ..	223-249
<hr/> CHAPTER IX. <hr/>	
Coast of Dalmatia and Albania from the gulf of Cattaro to Valona bay	250-269
<hr/> CHAPTER X. <hr/>	
Coast of Albania.—Corfu and its adjacent islands .. ..	270-293
<hr/> CHAPTER XI. <hr/>	
Gulf of Arta and coast of Greece.—Santa Maura, Cephalonia, Ithaca, and adjacent islands .. ..	294-333
<hr/> CHAPTER XII. <hr/>	
The island of Zante, gulfs of Patras and Corinth, and coast of the Morea from cape Papas to cape Matapan .. ..	334-373



## SYSTEM OF ORTHOGRAPHY.

*Adopted by the Admiralty for Sailing Directions and Charts.*

As far as has been found possible with existing knowledge, native names are spelt in accordance with the following system, which has been adopted by the principal authorities in Great Britain and by the United States, and has been for some years in process of gradual introduction into all Admiralty Sailing Directions and Charts.

No change is made in the orthography of foreign names in countries which use Roman letters; thus French, Spanish, Portuguese, Dutch, &c., names will be spelt as by the respective nations.

1. Where native names have been so long written in a form which, though not in accordance with this system, has become familiar to English eyes from being so spelt in all charts and maps, they are retained.

2. The true sound of the word as locally pronounced is taken as the basis of the spelling.

3. An approximation of the sound is alone aimed at. A system which would attempt to represent the more delicate inflections of sound and accent would be so complicated as only to defeat itself.

4. The broad features of the system adopted are that vowels are pronounced as in Italian and consonants as in English, *every letter being pronounced*. Two accents only are used:—

(1) The acute, to denote the syllable on which stress is laid. The use of this is very important, as the sounds of many names are entirely altered by the misplacement of this “stress.”

(2) The sign ~ over the letter U to denote the short sound of that vowel under certain circumstances. (*See Table*.)

5. When two vowels come together, each one is sounded, though the result, when spoken quickly, is sometimes scarcely to be distinguished from a single sound, as in *ai, au, ei*.

The amplification of the rules is given on the following pages.

Information is invited as to the proper spelling of native names, so as to produce the nearest approximation to the true sound, by this system.

Letters.	Pronunciation and Remarks.	Examples.
a	ah, a as in <i>father</i> - - - -	Java, Banána, Somáli, Bari.
e	eh, e as in <i>bet</i> ; a as in <i>fate</i> - - -	Tel-el-Kebír, Oléleh, Yezo, Levúka, Peru.
i	English e; i as in <i>ravine</i> ; the sound of ee in <i>beet</i> . Thus, not <i>Feejee</i> , but	Fiji, Hindi.
o	o as in <i>mote</i> - - - -	Tokyo.
u	long u as in <i>flute</i> ; the sound of oo in <i>boot</i> . oo or ou should never be employed for this sound. Thus, not <i>Zooloo</i> or <i>Zoulou</i> , but	Zulu, Sumatra.

Letters.	Pronunciation and Remarks.	Examples.
	<p>The shorter sound of the different vowels, when necessary to be indicated, can be expressed by doubling the consonant that follows. The sounds referred to are as follows :—</p> <p>The short <i>a</i> as in <i>fatter</i>, as compared with the long <i>a</i> as in <i>father</i>.</p> <p>The short <i>e</i> as in <i>better</i>, as compared with the long <i>e</i> as in <i>fate</i>.</p> <p>The short <i>i</i> as in <i>sinner</i>, as compared with the long <i>i</i> as in <i>ravine</i>.</p> <p>The short <i>o</i> as in <i>sobbing</i>, as compared with the long <i>o</i> as in <i>sober</i>.</p> <p>The short <i>u</i> as in <i>rubber</i>, as compared with the long <i>u</i> as in <i>rubric</i>.</p>	Yarra, Tanna, Mecca, Jidda, Bonny.*
ũ	<p>is the same short sound of <i>u</i> as is denoted by doubling the consonant following, but is used, and only used, where such doubling is impossible, as in the case of words where <i>u</i> is followed by two different consonants, as in <i>Tũng</i>, pronounced as the English <i>tongue</i>.</p> <p>Doubling of a vowel is only necessary where there is a distinct repetition of the single sound.</p>	Nuulúa, Oosima.
ai	English <i>i</i> as in <i>ice</i> - - - -	Shanghai.
au	<i>ow</i> as in <i>how</i> . Thus, not <i>Foochow</i> , but	Fuchau.
ao	is slightly different from <i>au</i> - - - -	Macao.
aw	when followed by a consonant or at the end of a word as in <i>law</i> - - - - thus	Cawnpore.
ei	is the sound of the two Italian vowels, but is frequently slurred over, when it is scarcely to be distinguished from <i>ey</i> in the English <i>they</i> , or <i>ei</i> in <i>eight</i> .	Beirút, Beilul.
b	English <i>b</i> .	
c	is always soft, but is so nearly the sound of <i>s</i> that it should be seldom used. If <i>Celébes</i> were not already recognised it would be written <i>Selébes</i> .	Celébes.
ch	is always soft as in <i>church</i> - - - -	Chingchin.
d	English <i>d</i> .	
f	English <i>f</i> . <i>Ph</i> should not be used for the sound of <i>f</i> . Thus, not <i>Haiphong</i> , but	Haifong, Nafa.
g	is always hard. (Soft <i>g</i> is given by <i>j</i> ) -	Galápagos.
h	is always pronounced when used.	
hw	as in <i>what</i> , better rendered by <i>hw</i> than <i>wh</i> , or <i>h</i> followed by a vowel. Thus, <i>Hwang ho</i> , not <i>Whang ho</i> or <i>Hoang ho</i> .	Hwang ho, Ngan hwei.
j	English <i>j</i> . <i>Dj</i> should never be put for this sound.	Japan, Jinchuen.

\* The *y* is retained as a terminal in this word under Rule 1. The word is given as a familiar example of the alteration in sound caused by the second consonant.

Letters.	Pronunciation and Remarks.	Examples.
k	English <i>k</i> . It should always be put for the hard <i>c</i> . Thus, not <i>Corea</i> , but	Korea.
kh	The Oriental guttural - - - -	Khan.
gh	is another guttural, as in the Turkish -	Dagh, Ghazi.
l	} As in English.	
m		
n		
ng	has two separate sounds, the one hard as in the English word <i>finger</i> , the other as in <i>singer</i> . As these two sounds are rarely employed in the same locality, no attempt is made to distinguish between them.	
p	As in English.	
ph	As in <i>loophole</i> - - - -	Mokpho, Chemulpho.
th	stands both for its sound in <i>thing</i> , and as in <i>this</i> . The former is most common -	Bethlehem.
q	should never be employed ; the sound of <i>qu</i> in <i>quiver</i> is given as <i>kw</i> . When <i>qu</i> has the sound of <i>k</i> , as in <i>quoit</i> , it should be given by <i>k</i> .	Kwangtung.
r	As in English.	
s	As in <i>sin</i> .	
sh	} As in English.	
t		
v		
w		Sawákin.
x		
y	is always a consonant, as in <i>yard</i> , and therefore should never be used as a terminal, <i>i</i> or <i>e</i> being substituted. Thus, not <i>Mikindány</i> or <i>Wady</i> , but not <i>Kwaly</i> , but	Kiküyu.  Mikindáni, Wadi. Kwale.
z	English <i>z</i> - - - -	Zulu.
zh	French <i>j</i> , or as <i>s</i> in <i>treasure</i> - - - - Accents should not generally be used, but where there is a very decided emphatic syllable or stress which affects the sound of the word, it should be marked by an <i>acute</i> accent.	Muzhdaha. Tongatábu, Galápagos, Paláwan, Saráwak.

In the case of native names in countries under the dominion of other European powers, in whose maps, charts, &c., the spelling is given according to the system adopted by that power, such orthography is, as a rule, disregarded, and the names are spelt according to the British system. Thus the island east of Java in possession of the Dutch is spelt *Madoera* by them, but on Admiralty charts *Madura*. A town in Java appears on Dutch charts as *Tjilatjap* ; in the British, *Chilachap*.

When a foreign language is written in a vocabulary of fixed sounds, so as to permit of transliteration into the British system, a table of equivalents

for each letter is drawn up, and names of places can be transliterated without regard to pronunciation.

To reduce Greek names to the orthographic form, required by the foregoing system, would require so many changes that it has been decided to defer the revision of Admiralty publications until the system has been more generally introduced and used.

The Greek names are therefore left for the present in their old shape, but these give in most cases a very erroneous idea of the sound of the names, as pronounced by Greeks, and in many cases the modern Greek spelling gives a clue to the pronunciation by aid of the table of equivalents.

Thus *Ευβοία* now spelt Eubœa is pronounced Evvia.

„ *Χαλκίς* „ Chalcis „ Khalkis.  
 „ *Κεφαλληνία* „ Cephallonia „ Kefallinia.

Whenever C appears in a Greek name as at present written it may be taken for granted it has the sound of K.

Greek Letters	Roman Equivalents by Admiralty System	Greek Letters	Roman Equivalents by Admiralty System
Α α	a	Ρ ρ	r
Β β	v	Σ σ ς	s
Γ γ	g	Τ τ	t
Δ δ	d	Υ υ	i
Ε ε	e	Φ φ	ph
Ζ ζ	z	Χ χ	kh
Η η	i	Ψ ψ	ps
Θ θ	th	Ω ω	o
Ι ι	i	ΑΙ αι	ei
Κ κ	k	ΕΙ ει	i
Λ λ	l	ΟΙ οι	i
Μ μ	m	ΟΥ ου	u
Ν ν	n	ΥΙ υι	i
Ξ ξ	x	ΑΥ αυ	aph, av
Ο ο	o	ΕΥ ευ	eph, ev
Π π	p	ΗΥ ηυ	iph, iv

# INFORMATION RELATING TO CHARTS, SAILING DIRECTIONS, AND THE GENERAL NAVIGATION OF H.M. SHIPS.

## ON THE CORRECTION OF CHARTS, LIGHT LISTS, AND SAILING DIRECTIONS.

THERE are three descriptions of publications as guides to navigation—the Charts, the Sailing Directions, and the Light Lists—which are all affected by the continual changes and alterations that take place.

Of these the charts should always be, so far as our knowledge permits, absolutely correct to date; and the Light Lists should be noted for the recent alterations, though space will not permit of full details being always inserted; the Sailing Directions, however, cannot, from their nature, be so corrected, and *in all cases where they differ from charts, the charts must be taken as the guide.*

**1. Charts.**—When issued to a ship on commissioning, the charts have received all necessary corrections to date. As sent from the Hydrographic Office they are, as a rule, fresh from the plates. They then receive such corrections by hand in the dépôts as are required, and are so issued to the ships.

The charts in the folios should have the same dates of correction as shown against each in the Lists pasted on the outside of the folio. The Navigating Officer is to satisfy himself that they do so agree before signing the receipt for the same.

All small but important corrections that can be made by hand are notified by Notices to Mariners, and should at once be placed on the charts to which they refer.

Large corrections that cannot be conveniently thus made are put upon the plates, and fresh copies are issued to the ships to replace the others, which are directed to be destroyed to prevent the possibility of their being used in the navigation of the ship.

The dates on which these large corrections are made are noted on the chart plates in the middle of the lower edge; those of the smaller corrections at the left-hand lower corners.

In all cases of quotations of charts, these dates of corrections should be given, as well as the number of the chart (which will be found in the lower right-hand corner), in order that at the Admiralty it may be known what edition of the chart is referred to.

For convenience of office reference each chart has now two numbers, the ordinary number in the right-hand lower corner, and a number in brackets, thus: [429] in the left-hand lower corner, which is now called the New Number.

These new numbers are also given in the Catalogue of Admiralty Charts.

**2. The Light Lists,** annually published at the beginning of each year, are not corrected in the dépôts before issue, but appendices are issued every two months, giving the alterations that have taken place, copies of which are put into the chart boxes.

It is the duty of the navigating officer when he receives the set of charts to make notations in the Light Lists from these appendices, and from the Notices to Mariners in the box; and to keep them so corrected from time to time.

The Light Lists should always be consulted as to the details of a light, as the description in the Sailing Directions may be obsolete, in consequence of changes made since publication. The charts also may not be equally up to date in some details, for which no Notices to Mariners have been issued.

3. *The Sailing Directions* are not corrected before issue, except occasionally for very important new rocks or dangers. Hydrographic Notices and Supplements referring to each volume are published from time to time.

Supplements contain all the information received up to date since the publication of the volume to which they refer, and cancel all previous Hydrographic Notices.

Hydrographic Notices contain all information up to date since the publication of the volume, or since the last Supplement or Hydrographic Notice, but endeavour is made to issue no more than one of these affecting each volume, and, on the collection of fresh information, to include the former Notice in a Supplement.

The existence of Supplements or Hydrographic Notices is to be noted, in the tabulated form placed for the purpose inside the cover of each volume, in cases when such notations have not been made before issue, and also on receipt of further Notices after commission.

Notes should be made in the margin of the volume of sailing directions affected, as references to the Supplements or Hydrographic Notices when the latter are printed on both sides.

To enable the books to be more conveniently corrected, however, such Supplements and Hydrographic Notices as are of moderate size are now being printed on one side only, and two copies are issued to each ship—one to cut up, the slips being pasted in at the appropriate place; the other to retain intact for reference.

To make these notations or paste in these slips is one of the early duties of a navigating officer after drawing his box of charts and books, and similar notes are to be made from Notices to Mariners that may thereafter be received.

It must, however, be thoroughly understood that sailing directions will never be correct in all details, except up to the date of the last Hydrographic Notice or Supplement, and that, as already stated, when differences exist, the chart, which should be corrected from the most recent information, should be taken as the guide; for which purpose, for ordinary navigation, they are sufficient.

---

## THE USE OF CHARTS AS NAVIGATIONAL AIDS, AND GENERAL REMARKS RELATING TO PRACTICAL NAVIGATION.

1. *Accuracy of a Chart.*—The value of a chart must manifestly depend upon the accuracy of the survey on which it is based, and this becomes more important the larger is the scale of the chart.

To estimate this, the date of the survey, which is always given in the title, is a good guide. Besides the changes that, in waters where sand or mud prevails, may have taken place since the date of the survey, the earlier surveys were mostly made under circumstances that precluded great accuracy of detail, and, until a plan founded on such a survey is tested, it should be regarded with caution. It may, indeed, be said that, except in well-frequented harbours and their approaches, no surveys yet made have been so minute in their examination of the bottom as to make it certain that all dangers have been found. The fulness or scantiness of the soundings is another method of

estimating the completeness of a chart. When the soundings are sparse or unevenly distributed, it may be taken for granted that the survey was not in great detail.

It appears to be insufficiently realised that the degree of reliance which may reasonably be placed upon an Admiralty chart, even in surveys of modern date, is mainly dependent on the scale on which the survey was made. The scale for publication is now generally that of the original survey, except in the case of Coast sheets, which are sometimes reduced. It should not, therefore, be assumed that the original survey was made on a larger scale than that published.

It must be borne in mind that the only method of ascertaining the inequality of the bottom of the sea is by the laborious process of sounding, and that in sounding over any area, the boat or vessel obtaining the soundings is kept on given lines; that each time the lead descends it only ascertains the depth of water over an area equal to the diameter of the lead, that is about two inches, and that consequently each line of soundings, though miles in length, is only to be considered as representing a width of two inches.

Surveys are not made on equal scales, but each survey is made on a scale commensurate with its apparent importance. For instance, a general survey of a coast which vessels only pass in proceeding from one place to another is not usually made on a scale larger than one inch to the nautical mile, whilst surveys of areas where vessels are likely to anchor are made on a scale of three inches to the mile, and surveys of frequented ports, or harbours likely to be used by Fleets, on a scale of from six inches to ten inches to the nautical mile.

Close examination by sounding is the only method by which surveys on a large scale can be made, and in view of the vast mileage of surveys yet requiring completion in the interests of navigation, it would be a waste of time to undertake large Coast surveys.

The scale on which a survey is to be conducted having been settled, it is manifestly superfluous to obtain more lines of soundings than can be represented on the paper. 100 soundings, which is the maximum number that can be placed with clearness on every square inch of paper, means that on a scale of one inch to the mile each sounding on the chart occupies an area representing eight acres of actual ground, whilst on a scale of six inches to the mile each sounding represents an area of a little less than a quarter of an acre, *i.e.*, of 100 feet square.

The following diagram represents as many soundings as can be placed legibly on a square inch of paper:—

16	15	15	13	13	14	12	11	10	9
14	15	14	14	13	13	12	11	9	8
15	15	14	17	16	14	13	10	10	9
16	16	17	18	16	12	11	8	9	10
16	17	15	12	9	7	7	7	9	10
19	16	12	9	5	4	5	6	8	9
22	19	16	10	3	5	6	7	8	10
20	16	12	7	5	6	5	7	8	10
18	15	11	9	7	7	7	8	10	11
20	17	14	11	12	10	9	10	11	13

Little assistance in detecting excrescences on the bottom is afforded by the eye, even in clear water, on account of the observer being within five feet of the surface; none in turbid seas. If there is no inequality in the soundings to cause suspicion, a patch between two lines may occasionally escape detection.

Lines of soundings plotted as close as may be practicable on a scale of 6 inches to the mile would be 100 feet apart, and each line would be only 2 inches in actual width.

Thus, in a chart on a scale of one inch to the mile, an inequality of some acres in extent rising close to the surface, if it happened to be situated between two lines, might escape the lead; whilst in a chart on a scale of 6 inches, inequalities as large as battleships, if lying parallel to, and between the lines of soundings, might exist without detection if they rose abruptly from an otherwise even bottom.

General Coast charts should not, therefore, be looked upon as infallible, and a rocky shore should on no account be approached within the contour line of 10 fathoms, without taking every precaution to avoid a possible danger; and even with surveys of harbours on a scale of 6 inches to the mile, vessels should avoid, if possible, passing over sharted inequalities in the ground, as some isolated rocks are so sharp that the lead will not rest on them.

Blank spaces among soundings mean that no soundings have been obtained in these spots. When the surrounding soundings are deep it may with fairness be assumed that in the blanks the water is also deep; but when they are shallow, or it can be seen from the rest of the chart that reefs or banks are present, such blanks should be regarded with suspicion. This is especially the case in coral regions and off rocky coasts, and it should be remembered that in waters where rocks abound it is always possible that a survey, however complete and detailed, may have failed to find every small patch.

A wide berth should therefore be given to every rocky shore or patch, **and this rule should be invariably followed, viz., that instead of considering a coast to be clear unless it is shown to be foul, the contrary should be assumed.**

2. *Fathom Lines a Caution.*—Except in plans of harbours that have been surveyed in detail, the five-fathom line on most Admiralty charts is to be considered as a caution or danger line against unnecessarily approaching the shore or bank within that line, on account of the possibility of the existence of undiscovered inequalities of the bottom, which nothing but an elaborate detailed survey could reveal. In general surveys of coasts or of little frequented anchorages, the necessities of navigation do not demand the great expenditure of time required for such a detailed survey. It is not contemplated that ships will approach the shores in such localities without taking special precautions.

The ten-fathom line is, on rocky shores, as before mentioned, another warning, especially for ships of heavy draught.

Charts where no fathom lines are marked must be especially regarded with caution, as it generally means that soundings were too scanty and the bottom too uneven to enable them to be drawn with accuracy.

Isolated soundings, shoaler than surrounding depths, should always be avoided, especially if ringed round, as there is no knowing how closely the spot may have been examined.

3. *Chart on Largest Scale always to be used.*—It sometimes happens that, from press of work, only the copper plate of the larger scale chart of a particular locality can at once receive any extensive re-arrangement of coastline or soundings. This is an additional reason, besides the obvious one of the greater detail shown, why this largest scale chart should always be used for navigating.

4. *Caution in using Small Scale Charts.*—In approaching the land or dangerous banks, regard must always be had to the scale of the chart used. A small error in laying down a position means only yards on a large scale chart, whereas on a small scale the same amount of displacement means large fractions of a mile. This is particularly

to be observed when coming to an anchor on a narrow ledge of convenient depth at some distance from the shore.

For the same reason bearings to objects near should be used in preference to objects farther off, although the latter may be more prominent, as a small error in bearing or in laying it down on the chart has a greater effect in misplacing the position the longer the line to be drawn.

**5. *Distortion of Printed Charts.***—The paper on which charts are printed has to be damped. On drying, distortion takes place from the inequalities in the paper, which greatly varies with different paper and the amount of the original damping; but it does not affect navigation. It must not, however, be expected that accurate series of angles taken to different points will always exactly agree, when carefully plotted upon the chart, especially if the lines to objects be long. The larger the chart the greater the amount of this distortion.

**6. *Buoys.***—It is manifestly impossible that any reliance can be placed on buoys always maintaining their exact position. Buoys should therefore be regarded as warnings and not as infallible navigating marks, especially when in exposed positions; and a ship should always, when possible, be navigated by bearings or angles of fixed objects on shore and not by buoys.

***Gas Buoys.***—The lights shown by gas buoys cannot be implicitly relied on, as, if occulting, the apparatus may get out of order, or the light may be altogether extinguished. These lights in the British Islands are from 10 to 50 candle-power.

**7. *Lights.***—Circles drawn on charts round a light are not intended to give information as to the distance at which it can be seen, but solely indicate, in the case of lights which do not show equally in all directions, the bearings between which the variation, or visibility, or obscuration of the light occurs.

All the distances given in the Light Lists and on the charts for the visibility of lights are calculated for a height of an observer's eye of 15 feet. The table of distances visible due to height at the end of each Light List affords a means of ascertaining how much more or less the light is visible should the height of the bridge be more or less. The glare of a powerful light is often seen far beyond the limit of visibility of the actual rays of the light, but this must not be confounded with the true range. Again, refraction may often cause a light to be seen farther than under ordinary circumstances.

When looking out for a light at night, the fact is often forgotten that from aloft the range of vision is much increased. By noting a star immediately over the light a very correct bearing may be afterwards obtained from the standard compass.

The intrinsic power of a light should always be considered when expecting to make it in thick weather. A weak light is easily obscured by haze, and no dependence can be placed on its being seen.

The power of a light can be estimated by remarking its order, as given in the Light Lists, and in some cases by noting how much its visibility in clear weather falls short of the range due to the height at which it is placed. Thus, a light standing 200 feet above the sea, and only recorded as visible at 10 miles in clear weather, is manifestly of little brilliancy, as its height would permit it to be seen over 20 miles, if of any power. (*See table in Light List before mentioned.*)

The distance from a light cannot be estimated either by its brilliancy or its dimness.

**8. Fog Signals.**—Sound is conveyed in a very capricious way through the atmosphere. Apart from wind, large areas of silence have been found in different directions and at different distances from the fog signal station, in some instances even when in close proximity to it. The apparatus, moreover, for sounding the signal often requires some time before it is in readiness to act. A fog often creeps imperceptibly towards the land, and is not observed by the people at a station until it is upon them; whereas a ship may have been for many hours in it, and approaching the land. In such a case no signal may be made. When sound has to travel against the wind, it may be thrown upwards; in such a case, a man aloft might hear it when it is inaudible on deck. Under certain conditions of the atmosphere, when a fog signal is a combination of high and low notes, one of the notes may be inaudible.

The mariner should not assume—

- a. That he is out of hearing distance, because he fails to hear the sound.
- b. That, because he hears a fog signal faintly, he is at a great distance from it.
- c. That he is near it, because he hears the sound plainly.
- d. That the distance from and the intensity of the sound on any one occasion is a guide to him for any future occasion.
- e. That the fog signal has ceased sounding, because he does not hear it even when in close proximity.

Taken together, these facts should induce the utmost caution in closing the land in fogs. The lead is generally the only safe guide.

**9. Tides and Tidal Streams.**—In navigating coasts where the tidal range is considerable, caution is always necessary. It should be remembered that there are indraughts to all bays and bights, although the general run of the stream may be parallel to the shore.

The turn of the tidal stream off-shore is seldom coincident with the time of high and low water on the shore. In open channels, the tidal stream ordinarily overruns the turn of the vertical movement of the tide by about three hours, forming what is usually known as tide and half-tide, the effect of which is that at high and low water by the shore the stream is running at its greatest velocity.

In crossing a bar or shallow flats, the table (B) at page 146 of the Tide Tables will be found of great assistance in calculating how much the water has risen or fallen at any hour of the tide.

On coasts where there is much diurnal inequality in the tides, the amount of rise and fall can never be depended upon, and additional caution is necessary.

It should also be remembered that at times the tide falls below the level of low-water ordinary springs. This always occurs on the coasts of Europe at the equinoxes, but in other parts of the world, and especially in the tropics, such periodic low tides may coincide more frequently with the solstices. Wind or a high barometer may produce it at any time, and the amount varies with locality. When the moon's perigee coincides with the full or new moon the same effect is often produced.

**10. Arrows** on charts only show the most usual or the mean direction of a tidal stream or current. It must never be assumed that the direction of a stream will not vary from that indicated by the arrow. In the same manner, the rate of a stream constantly varies with circumstances, and the rate given on the chart is merely the mean of those found during the survey, possibly from very few observations.

**11. Fixing Position.**—The most accurate method of fixing a position relative to the shore is by angles between well-defined objects on the chart. All ships are now being supplied with a station pointer, and this method should be used whenever possible.

Two things are, however, necessary to its successful employment. First, that the objects be well chosen; and second, that the observer is skilful and rapid in his use of the sextant.

For the former, reference can be had to the pamphlet on the use of the station-pointer, which is in every chart box; the latter is only to be obtained by practice.

It will readily be seen that in war time, when the compass may be knocked away, or rifle-fire may make it undesirable to expose the person more than necessary, a sextant offers great advantages, as angles can be obtained from any position whence the objects are visible. It is this contingency that makes it especially desirable that all navigating officers should become expert in this method of fixing a ship's position.

In many narrow waters also, where the objects may yet be at some distance, as in coral harbours or narrow passages among mud banks, navigation by sextant and station-pointer is invaluable, as a true position can only be obtained by its means. A small error in either taking or plotting a bearing under such circumstances may put the ship ashore.

It is not intended that the use of the compass to fix the ship should be given up; there are many circumstances in which it may be usefully employed, but errors more readily creep into a position so fixed. In all cases where great accuracy of position is desired, angles should invariably be used, such as the fixing of a rock or shoal, or of additions to a chart, as fresh soundings or new buildings. In all such cases angles should be taken to several objects, the more the better; but five objects is a good number, as the four angles thus obtained not only prevent any errors, but they at once furnish a means of checking the accuracy of the chart itself. In the case of ordinary soundings, it is only necessary to take a third angle now and then; firstly, to check the general accuracy of the chart as above stated; secondly, to make certain that the more important soundings, as at the end of a line, are correctly placed.

Sometimes, when only two objects are visible, a compass bearing and sextant angle may be used with advantage.

In passing near a point of land, or an island, the method of fixing by doubling the angle on the bow is invaluable. The ordinary form of it, the so-called "four-point bearing," when the bearing is taken four points on the bow, and on the beam, the distance from the object at the latter position being the distance run between the times of taking the two bearings, allowing for current, gives an excellent fix for a departure, but does not ensure safety, as the point and probably the rocks off it are abeam before the position is obtained.

By taking the bearings of two points and four points on the bow, a very good position is obtained before the object is passed; the distance of the latter at the second position being, as before, equal to the distance run in the interval, allowing for current.

A table of factors, by which to multiply the distance run, to obtain the distance of the object when any number of degrees between the two bearings has been observed, is now supplied in all chart boxes.

The use of a danger angle in passing outlying rocks with land behind should also not be forgotten. In employing this method, however, caution is necessary, as should the chart be not accurate, *i.e.*, should

the objects selected be not quite correctly placed, the angle taken off from it may not serve the purpose. It should not, therefore, be employed when the survey is old or manifestly imperfect.

In fixing by the compass, it must always be remembered that two bearings only are liable to error. An absolute error may be made in either bearing observed; errors may be made in applying the deviation; or errors may creep in in laying them on to the chart. For these reasons, a third or check bearing of some other object should be taken, especially when near the shore or dangers. The coincidence of these three lines will prevent any mistakes.

Amongst astronomical methods of fixing a ship's position, attention is drawn to the great utility of Sumner's method. A Sumner line, that is, a line drawn through the position (obtained by an assumed latitude and longitude by chronometer) at right angles to the bearing of the sun as obtained from the azimuth tables, gives at times invaluable information, as the ship must be somewhere on that line provided the chronometer is correct. A deep cast of the lead at the same time may often serve to get an approximate position on the line. An early and very accurate position can also be obtained by Sumner's method, by getting a longitude by a bright star at daylight when the horizon is well visible, and another longitude by the sun when a few degrees above the horizon, or by observing two or more stars at twilight. The Sumner lines drawn through the two positions thus obtained will, if the bearing of sun and star differ three points or more, give an excellent result.

**12.** *Change of Variation of the Compass.*—The gradual change in the variation must not be forgotten in laying down positions by bearing on charts. The magnetic compasses placed on the charts for the purpose of facilitating plotting become in time slightly in error, and in some cases, such as with small scales, or when the lines are long, the displacement of position from neglect of this change may be of importance. The compasses are re-engraved when the error amounts to a quarter of a point, but the chart plates cannot be corrected more frequently from the impossibility of making alterations too often on one spot in a copper plate.

The geographical change in the variation is in some parts of the world sufficiently rapid to need consideration. For instance, in approaching Halifax from Newfoundland the variation changes  $10^{\circ}$  in less than 500 miles. The variation chart should be consulted on this head.

**13.** *Local Magnetic Disturbance of the Compass on board Ship.*—The term "local magnetic disturbance" has reference only to the effects on the compass of magnetic masses external to the ship in which it is placed. Observation shows that disturbance of the compass in a ship afloat is experienced only in a few places on the globe.

Magnetic laws do not permit of the supposition that it is the visible land which causes such disturbance, because the effect of a magnetic force diminishes in such rapid proportion as the distance from it increases that it would require a local centre of magnetic force of an amount absolutely unknown to affect a compass half a mile distant.

Such deflections of the compass are due to magnetic minerals in the bed of the sea under the ship, and when the water is shallow, and the force strong, the compass may be temporarily deflected when passing over such a spot, but the area of disturbance will be small, unless there are many centres near together.

It is very desirable that whenever a ship passes over an area of local magnetic disturbance, the position should be fixed, and the facts reported as far as they can be ascertained.

**14. Use of Oil for Modifying the Effect of Breaking Waves.**—Many experiences of late years have shown that the utility of oil for this purpose is undoubted, and the application simple.

The following may serve for the guidance of seamen, whose attention is called to the fact that a very small quantity of oil, skilfully applied, may prevent much damage both to ships (especially the smaller classes) and to boats, by modifying the action of breaking seas.

The principal facts as to the use of oil are as follows:—

1. On free waves, *i.e.*, waves in deep water, the effect is greatest.
2. In a surf, or waves breaking on a bar, where a mass of liquid is in actual motion in shallow water, the effect of the oil is uncertain, as nothing can prevent the larger waves from breaking under such circumstances; but even here it is of some service.

3. The heaviest and thickest oils are most effectual. Refined kerosene is of little use; crude petroleum is serviceable when nothing else is obtainable; but all animal and vegetable oils, such as waste oil from the engines, have great effect.

4. A small quantity of oil suffices, if applied in such a manner as to spread to windward.

5. It is useful in a ship or boat, both when running, or lying to, or in wearing.

6. No experiences are related of its use when hoisting a boat up in a sea-way at sea, but it is highly probable that much time and injury to the boat would be saved by its application on such occasions.

7. In cold water, the oil, being thickened by the lower temperature, and not being able to spread freely, will have its effect much reduced. This will vary with the description of oil used.

8. The best method of application in a ship at sea appears to be: hanging over the side, in such a manner as to be in the water, small canvas bags, capable of holding from one to two gallons of oil, such bags being pricked with a sail needle to facilitate leakage of the oil.

The position of these bags should vary with the circumstances. Running before the wind, they should be hung on either bow—*e.g.*, from the cathead—and allowed to tow in the water.

With the wind on the quarter the effect seems to be less than in any other position, as the oil goes astern while the waves come up on the quarter.

Lying to, the weather bow and another position farther aft seem the best places from which to hang the bags, with a sufficient length of line to permit them to draw to windward, while the ship drifts.

9. Crossing a bar with a flood tide, oil poured overboard and allowed to float in ahead of the boat which would follow with a bag towing astern, would appear to be the best plan. As before remarked, under these circumstances the effect cannot be so much trusted.

On a bar with the ebb tide it would seem to be useless to try oil for the purpose of entering.

10. For boarding a wreck, it is recommended to pour oil overboard to windward of her before going alongside. The effect in this case must greatly depend upon the set of the current, and the circumstances of the depth of water.

11. For a boat riding in bad weather from a sea anchor, it is recommended to fasten the bag to an endless line rove through a block on the sea anchor, by which means the oil is diffused well ahead of the boat, and the bag can be readily hauled on board for refilling if necessary.





**IN THIS WORK THE BEARINGS ARE ALL MAGNETIC,  
EXCEPT WHERE MARKED AS TRUE.**

**THE LATITUDES AND LONGITUDES GIVEN IN THE  
MARGIN ARE APPROXIMATE.**

**THE VARIATION GIVEN IN THE MARGIN OF THE  
PAGES IS FOR THE YEAR 1907.**

**THE BEARINGS OF THE LIMITS OF VISIBILITY OF ARCS  
OF LIGHTS ARE FROM SEAWARD OR TOWARDS  
THE LIGHT.**

**THE DISTANCES ARE EXPRESSED IN SEA MILES OF  
60 TO A DEGREE OF LATITUDE.**

**A CABLE'S LENGTH IS ASSUMED TO BE EQUAL TO  
100 FATHOMS.**

**THE SOUNDINGS ARE REDUCED TO LOW WATER OF  
ORDINARY SPRING TIDES.**





For details of sectors and the latest information respecting the Lights which are included in this work, seamen should consult the Admiralty List of Lights, Part V. This List is published early in every year, corrected to the preceding 31st December.

(10429). Wt. 43535/506. 10,000.—2/15. T.G.E

THE HISTORY OF THE  
CITY OF BOSTON  
FROM THE FIRST SETTLEMENT  
TO THE PRESENT TIME  
BY NATHANIEL BENTLEY  
VOLUME I  
PUBLISHED BY  
J. B. LEECH, 15 NASSAU ST.  
N. Y.

THE  
MEDITERRANEAN PILOT.

VOL. III

---

CHAPTER I.

GENERAL INFORMATION. — ADRIATIC SEA. — COASTS OF  
ADRIATIC AND MOREA. — SOUNDINGS. — ISLANDS. —  
GULFS. — COMMUNICATION. — WINDS AND WEATHER,  
THE BORA, &C. — CURRENTS. — TIDES. — NAVIGATION  
OF THE ADRIATIC.

---

**GENERAL REMARKS.**—The portion of the Mediterranean sea, described in this volume, comprises the Adriatic sea, the Ionian islands, the coast of Albania, the gulfs of Arta and Corinth, and the western and southern coasts of Greece as far as cape Matapan, the southern extreme of the Morea. The limits and distinctive features of the Adriatic are so very marked and important, that, whilst the first chapter is chiefly devoted to a general outline of its peculiarities, the details occupy the following eight chapters; the remaining three being devoted to the description of that part of the Albanian coast lying southward of the Adriatic, the Ionian islands, coasts of Greece, &c., as enumerated above.

**ADRIATIC SEA.**—The Adriatic sea or gulf of Venice is the great expanse of waters which, branching off north-westward from the main body of the Mediterranean sea, is bounded by Italy on the west, and by the Austrian provinces and Albania on the east.

The name *Adriatic* is derived from the city of *Adria* or *Hadria*, founded in 1376 B.C. by an Etruscan colony and once the most important town in the Adriatic, but now in ruins, some fifteen miles inland at the upper part of the gulf of Venice. The latter name is of course derived from the city of Venice, which was for centuries the chief city in the Mediterranean; it is now usually applied only to the gulf or bay at the head of the Adriatic on the shores of which Venice stands.

**Extent.**—The Adriatic, from its southern limit between cape Sta. Maria di Leuca and the island of Corfu to its northern termination at the Venetian shore and gulf of Trieste, is about 460 miles in length in a general north-westerly direction. From Brindisi in Italy and Durazzo in Albania, the sea north-westward is bounded by two nearly parallel shores, the general breadth being about 90 miles, and the greatest, between Fano

and Novi, 110 miles. The narrowest part is at the entrance between capes Otranto and Linguetta, distant apart rather less than 40 miles.

**The Basin** of the Adriatic is said to be slowly diminishing in size. There are numerous evidences of encroachment of the land on the sea through the deposit of soil by rivers. From Ancona northward, numerous streams swollen to torrents by rains in the Apennines carry vast quantities of deposit into the sea; and, owing to the peculiar situation of the high mountains of Illyria, the head of the gulf of Venice receives all the waters flowing from the southern declivities of the Alps and of the Carniola mountains, situate between the Po and the Isonzo; here also flow out the Adige, Brenta, Piave, Livenza, Tagliamento, and numerous minor streams, each carrying down, in freshets, great quantities of alluvium, mud, and gravel, into the lagoons, and forming vast shallows which border the intervening shore.

The effect of this deposit is perceptible along the greater part of the coast of Italy, but especially so between Maestra and Sdobba points. Thus, Aquilea, which once may have stood near the sea, has long been an inland town, whilst the harbours of Liquentio, Romantino, and Timaro, said by Pliny to have existed on this coast, have entirely disappeared; and Adria, which was a station for the Roman fleet, is now, as before stated, 15 miles inland. Another town of the name of Spina, formerly bordered by quays, is now completely buried under the sands. Ravenna, built on islands and piles on the margin of the sea, was, in the time of Theodosius the Great, a military port subject to the influence of the tide; it is now between 4 and 5 miles inland, in the midst of gardens and fields. Portus Classis, its ancient harbour, has become a marsh 4 miles from the sea, from which it is separated by the Pineto or pine forest. These flat lands are subject to malaria in summer.

**The colour** of the Adriatic, when undisturbed by an accidental or local cause, is darker than the general colour of the Mediterranean, being of a greenish hue. The specific gravity at its mouth was found by Captain Smyth to be 1.0291, at the depth of 40 fathoms.

**COAST.**—The two shores of the Adriatic differ entirely in aspect and character, the eastern shore being generally rocky, replete with islands and ports bold of approach, but deficient in inhabitants, provisions, and in many parts, fresh water; the Italian shore, on the contrary, is comparatively shallow, almost destitute of large ports, yet in most parts populous and abounding in provisions, water and articles of trade. This peculiarity has so great an influence on the navigation of the sea, that mariners cannot be too careful in making themselves acquainted with the advantages and inconveniences presented by the two shores before they decide on their route.

**The Western shore of the Adriatic** is the Italian seaboard beginning at cape Sta. Maria di Leuca in the south-east and terminating to the north-westward at port Buso, the entrance of the river Ausa, at the boundary between Italy and Austria.

It is generally low and trends in a north-westerly direction as far as Ravenna, from whence it bends northward forming the Venetian shore. Its general uniformity is broken chiefly at three places; first, at mount Gargano or St. Angelo, near the Tremiti islands; secondly, at mount Conero, between Loreto and Ancona; and, thirdly, at the delta formed by deposits at the mouths of the Po. The two first being high and

terminating in well-defined elevations, are excellent land-marks. The celebrated chain of the Apennines runs almost parallel to the Abruzzo coast between these two elevations. The summits of mount Corno or Gran Sasso d'Italia, 9,560 feet high, and of mount Majella, (9,160 feet), which are its highest points, are remarkable, and may be seen at a great distance in clear weather.

The shore consists chiefly of sandy beaches, and, with the exception of the two points where the land rises, the soundings along it are regular, with a shallower approach than on the opposite coast. Roadsteads are scarce; there are many harbours, of which a few only are capable of admitting large vessels, but which, chiefly by artificial means, have been made suitable to the busy trade carried on along this thickly populated shore. The most important products exported are corn, rice, fruit, oil, wine, cotton, wool, silk, and salt. The great lakes Varano and Lesina, between the village of Peschici and the town of Termoli, have long been celebrated for the abundance, variety, and excellence of their fish; the margins of the lakes are said to be unhealthy.

As has been already stated, the great number of rivers and streams intersecting the north-western portion of this coast from Ancona to the river Isonzo, near the head of the gulf of Trieste, bring down quantities of sand and mud, causing the shore to be encumbered by shallows, and nearly all the harbours to be more or less obstructed. The Italian coast is, however, always easily navigable in fine weather, and can be approached sufficiently near for the recognition of its most conspicuous objects, which may generally be seen from a distance of 10 to 12 miles.

**The Eastern shore** of the Adriatic embraces the Austrian dominions of Istria, Croatia, Dalmatia, Ragusa, and the mouths of the Cattaro, a short strip of Montenegrin sea-board, and part of the Turkish province of Albania. It is in general, high and picturesque, with almost perpendicular cliffs, and very deep water along the shore. To these features, however, there is an exception between the gulf of Drin and cape Linguetta, where the shore is low and sandy, and the water is not so deep. This coast also runs almost south-east and north-west, and in some places forms deep bays. From cape Promontore to Ragusa it is entirely bordered by islands, rocks, and shoals, which render the navigation intricate and often unsafe when overtaken by the Bora.

Mariners, notwithstanding, give the preference to the eastern coast, particularly during the winter season, as it has good harbours, and, in many parts, affords shelter in bad weather; whilst, on the western coast, the only ports available for vessels of the deepest draught are Brindisi and Ancona, and the open anchorage in the gulf of Manfredonia, and even these are often difficult of access.

The water on almost every part of the coasts of Istria, Croatia, and Dalmatia, to the gulf of Drin and between the islands, is generally deep very near the land; but, between the gulf of Drin and cape Linguetta, as before mentioned, the shore is not so bold, being bordered by shallow water with moderate depths extending some distance seaward.

The greater part of the eastern coast of the Adriatic is barren and uninhabited, and the trade insignificant; with the exception of Trieste, Fiume, and Valona, the inhabitants of almost all the towns and islands are poor; and provisions, including water, are generally difficult to be obtained.

**Coast of southern Albania and Greece.**—Southward of cape Linguetta the coast trends south-south-eastward about 260 miles to Venetico island, the gulfs of Arta, Patras, and Corinth being within this space, and the coast being fronted by six of the seven Ionian islands. From Venetico, with the deep gulf of Kalamata intervening, cape Matapan lies to the south-eastward, distant 35 miles.

The features characteristic of this coast line are much the same as those of the eastern side of the Adriatic, viz., a high and picturesque sea-board, sparsely populated, deep water close in-shore, and a lofty mountainous interior visible when 60 or 80 miles distant seaward. The exceptions as regards the sea-board are chiefly in the neighbourhood of the entrances to the gulfs of Prevesa and Patras where the land is low and marshy.

**SOUNDINGS.**—In general, the soundings along shore are in accord with the general character of the coast. Where the land is high and rocky, deep water will be found, and vessels may approach to a prudent distance; where it is low, level, and sandy, the water is shallow.

**Soundings in the Adriatic.**—The shoalest water in the Adriatic is in the gulfs of Venice and Trieste, and especially along the Venetian shore and at the mouths of the Po. The nature of the ground follows an almost uniform rule along the whole of this coast; fine sand is found near the beach, seaward of which sand mixed with mud, and lastly mud; in some few places, the bottom is clay covered with soft mud, and sometimes marl intermixed with sand and clay. The distance to which these several zones extend varies according to the strength of the current inshore and its extension seaward. Mud bottom, suitable for anchorage, will almost always be found between the distance of one to three miles from the land, and the nature of the bottom is mud nearly everywhere towards the middle of the Adriatic.

But little difference exists between the matter of which the nearly horizontal layers of the bed of the Adriatic is composed and that of the surrounding continent, islands, and rocks. A white marble of uniform grain, resembling the substance of the Istrian, Morlacca, and Dalmatian countries often occurs; in some places are found gravel, sand, and other matters, more or less metalliferous. Near the beginning of the eighteenth century, Vitaliano Donati invited attention to the formation of a concretion of crustaceans, testaceans, and polyps, partially petrified and intermixed with earth, which is said to be increasing and may have the effect of gradually decreasing the depth.

An extensive bank of mud intermixed with chalky and other matter, which by gradual growth may eventually form an island, has risen in the middle of the gulf of Venice, where the depths are less than in other parts of the Adriatic.

A depth of from 460 to 470 fathoms is found in the entrance to the Adriatic about midway between capes Linguetta and Otranto. From thence to a line connecting Gargano head and Meleda island, the whole central portion of the gulf consists of a deep basin of from 550 to 680 fathoms, and with an extreme depth of 869 fathoms at one spot about 35 miles north-eastward of Brindisi. This basin terminates north-westward in a narrow tongue over 100 fathoms deep, passing north-eastward of the Pelagosa islands. Between Ortona on the Italian and

Sebenico on the Dalmatian shore, another deep of from 80 to 133 fathoms almost crosses the gulf; but, north-westward of this line, the water soon shoals to from 50 to 60 fathoms, and thenceforward its central depth continues to shoal gradually and evenly towards the head of the gulf.

The line of deepest soundings, after passing about 30 miles southward of the island of Meleda and southward of Lagosta, between Cazza and Pelagosa, takes a north-westerly direction; very near Pomo islet the depth is about 100 fathoms. This line of comparatively deeper soundings then crosses the deep before described and approaches the Dalmatian coast, passing about 10 miles westward of Incoronata island, from whence it takes nearly a middle course though bordering on the eastern shore of the sea, to the parallel of cape Promontore; at 25 miles westward of which cape, the depth is about 25 fathoms, gradually decreasing towards the gulf of Trieste.

In the gulf of Venice, the water shoals very gradually, the depth varying between 9 and 25 fathoms; relatively to the rest of the Adriatic, this part appears to be, as a submarine plateau, a continuation of the great plains of Lombardy and Friuli.

**Soundings south-eastward of the Adriatic.** — The great depths of the eastern basin of the Mediterranean border the western shores of the Ionian islands and the western and southern shores of the Morea, consequently the soundings in the vicinity of these coasts, sometimes called the Ionian sea, are very deep. At 5 miles westward of Fano, the north-western islet of Corfu, 574 fathoms have been found; 12 miles westward of Paxo, 645 fathoms; 8 miles westward of Cephalonia, no bottom with 1,300 fathoms of line; off the gulf of Arcadia, at from 15 to 20 miles from the shore, from 600 to 900 fathoms; and, as the south-western extreme of the Morea is approached, the depths become still greater, over 2,000 fathoms being found 7 miles south-westward of Sapienza and 1,500 fathoms within  $3\frac{1}{2}$  miles of that island. At 6 miles southward of cape Matapan the depth is 1,035 fathoms, but 10 miles westward of that cape it is 560 fathoms, though between this spot and the deep soundings off Sapienza, nothing less than 1,000 fathoms is known to exist.

Following the 100-fathoms line of soundings south-eastward from Fano, it is found to be within 6 or 7 cables of the western extreme of that island; passing Corfu, it is at places less than a mile from the shore and nowhere more than  $3\frac{1}{2}$  miles; it skirts Paxo and Anti-Paxos at from 5 cables to one mile and then curves in eastward, but is distant about 8 miles from the mainland abreast of the gulf of Prevesa; from thence it trends southward, closely bordering the coasts of Santa Maura, Cephalonia, and Zante, in some places scarcely a cable distant from the shore. Between Zante and the mainland of the Morea, 9 miles distant, the depth is from 250 to 300 fathoms; but, again following the 100-fathoms line along the shore of the Morea to cape Matapan from cape Trepito opposite Zante, where it is less than one mile from the shore, it is found to be nowhere more than 5 miles from the land at the head of the bays; and, from the headlands, only one or two miles, and considerably less than that on the southern coast.

With the exception of the gulf of Arta, where the depths are very moderate, about 36 fathoms being the maximum, the soundings in all the channels inside the Ionian islands and in the gulfs and bays comprised

within the limits of this description are uniformly deep, but they are more particularly dealt with in detail hereafter.

**ISLANDS.**—Almost all the islands of the Adriatic are along the eastern coast between Ragusa and cape Promontore. They are very numerous, and appear to have originated in the breaking up of the lower grounds by some violent action, which has left their limestone summits above water. By the salient position of the promontory terminating in Planka point, they are divided into two distinct groups. The principal islands lying southward of Planka point are, Meleda, Curzola, Lesina, Brazza, Lissa, and Lagosta; northward of the point, the most important are Zuri, Incoronata, Grossa, Cherso, Veglia, Pago, and Lussin.

All these islands are narrow in proportion to their length, their general direction being nearly parallel with the coast line, and various channels, generally named after the nearest adjacent island, lie between them, which channels being deep, with but few hidden dangers, afford a variety of secure passages. The islands abound with ports and harbours, of which some are of considerable capacity.

Near Gargano head, on the Italian coast, are the Tremiti islands, a group of four islets, under whose southern side good shelter from the Bora may be found. Southward of Lissa is the isolated rocky isle of Pelagosa, nearly in the middle of the Adriatic, and, between it and the Tremiti islands, the low and dangerous Pianosa islet; lastly, west-north-westward of Lissa is Pomo, a high pyramidal rock, and between Lissa and Pomo is St. Andrea islet.

Southward of the entrance to the Adriatic, and fronting the Albanian and Greek coasts, are the Ionian islands; Corfu, on the north; then Paxo and Anti-Paxos; Santa Maura, only separated from the mainland at its northern end by a boat-canal; Cephalonia and Ithaca, immediately fronting the entrance to the gulf of Patras; and Zante, 8 miles farther southward. Of these, Corfu, Santa Maura, Cephalonia, and Zante are all very mountainous, Cephalonia being the highest; they are populous and have excellent harbours, their soil is generally fertile, and their scenery unsurpassed in any part of the world. Between these islands and the mainland are many smaller islands, rocks, and islets, but none at any distance outside them except where Samothraki, Fano, and Merlera, with other small islets, having deep channels between them, occupy a space extending 15 miles from the north-western coast of Corfu; and, again, 24 miles southward of Zante, where the little Strovathi group of rocky islets, of which Stamphani, the largest, is less than a mile in extent, lie off the gulf of Arcadia, 27 miles from the nearest land of the Morea, and are surrounded by deep water, the 100-fathoms line being only 2 or 3 cables distant from their south-western side and at no other part more than three-quarters of a mile.

**GULFS.**—The smaller gulfs within the Adriatic are: the gulf of Manfredonia, the only one on the Italian coast, lying southward of Gargano head, between it and the town of Trani; it recedes about 17 miles westward from that line. The shallow gulf of Venice, included between Tagliamento and Maestra points receding about 20 miles from this line, its depth of water within this limit nowhere exceeding 15 fathoms. The gulf of Trieste, in the most northern part of the sea, extending 20 miles in an E.N.E. direction, and comprised between Tagliamento point on the north, and Salvore point

in Istria, about 18 miles apart. The depth of water within these limits, as in the gulf of Venice, being everywhere less than 15 fathoms.

The gulf of Quarnero is separated by the peninsula of Istria from the gulf of Trieste; from thence, it extends about 60 miles south-eastward, and is contained between cape Promontore, the land of Nona, and Grossa island. It is in great part occupied by islands, from the four most important of which, Cherso, Veglia, Arbe, and Pago, the gulf is said to derive its name.

The small gulf of Cattaro, a peculiarly formed basin, indented and surrounded by steep cliffs, is on the eastern coast of the Adriatic, overlooked by the lofty and rugged mountains of Montenegro. Fifty miles farther southward between Menders point and cape Rodoni, is the gulf of Drin, affording good anchorage with off-shore winds.

Southward of the Adriatic is the gulf of Arta, entered by the strait of Prevesa, and forming the boundary between the Turkish province of Albania and the Kingdom of Greece; it recedes about 20 miles from the coast line, and its shores abound in interesting remains of antiquity.

About 40 miles farther southward is the gulf of Patras, which extends eastward about 30 miles from the island of Ozia at its entrance, and is itself the entrance channel to the gulf of Corinth, or Lepanto. It varies in width from about 6 to 10 miles, and narrows to but little more than a mile at its eastern end. The town of Missolonghi is on its northern side, in the rear of salt marshes and lagoons; and on its southern shore is the important town of Patras, one of the most thriving in Greece.

The gulf of Corinth, from its entrance between Rumelia and Morea castles, recedes nearly 70 miles in an E.S.E. direction, and has an average width of about 10 miles, with some deep bays, especially on its northern shore. At its south-eastern corner, it is only separated from the gulf of Athens on the opposite side by the isthmus of Corinth, about  $3\frac{1}{2}$  miles wide. The shores on both sides consist of lofty rugged mountains, with narrow cultivated plains and rough torrent beds bordering the shores. The depths are generally very great and the shores steep-to. The principal ports are Vostitza on the southern shore, Galaxidi and Salona on the northern; the last within an easy ride of the ancient oracle of Delphi.

On the western coast of the Morea is the gulf of Arcadia, which would be more correctly termed a bay; and, on its southern coast the deep gulf of Kalamata, separated from the gulf of Kolokithia by the Mani peninsula which terminates in cape Matapan. With the exception of the rather important town of Kalamata, these gulfs are so destitute of good ports, and, owing to the general sterility of the rugged land, so thinly populated, that they are of but small importance to the mariner.

**COMMUNICATION. — Railways.** — On the Italian shore intercourse either by land or water is carried on with great facility. The coast line railway commencing at Brindisi, with a branch line southward to Otranto and westward to Taranto, passes through or within easy reach of nearly all the ports in this populous district as far northward as Rimini, with several branches connecting it with the large towns of the interior. The marshy lands, streams, and lagoons round the north-western end of the Adriatic, interrupt and do away with the need of a coast railway at this part; but Venice itself is connected with the system of the mainland by a viaduct 4,000 yards in length, across the lagoons. From Venice eastward the same natural difficulties exist up to and beyond the Austrian frontier at port Buso.

Trieste, the principal commercial port of Austria, is in direct communication with Vienna by the Austro-Hungarian system, as are also Rovigno and Pola in the Istrian peninsula, and Fiume in the gulf of that name, from whence the railway turns inland, connecting this latter port with Agram and Buda-Pesth, the capital of Hungary. From Fiume southward the whole eastern coast of the Adriatic is destitute of railway accommodation, with the exception of a short line connecting Sebenico and Spalato, and both these ports with the town of Knin in the interior. There is, however, a railway with terminus at Metkovic and Herzegovina, situated 8 miles from the coast south-east of port Tolero, which runs to Mostar and Seraievo; also a narrow-gauge line from Antivari to Vispazar on lake Scutari.

Beyond the southern limit of the Adriatic, the same want of railway accommodation exists in Turkish and Greek territory until southward of the gulf of Corinth, there being none whatever between Spalato and that gulf except that above mentioned between Metkovic and Seraievo, nor in any of the Ionian islands. In the Morea, however, on the southern shore of the gulf of Corinth, runs the direct railway from Athens, connecting Vostitza, Patras, Katakolo, and Pyrgos with that city, and also with the important port of Nauplia on the eastern coast of the Morea, which latter port is also in connection with Kalamata on the southern coast.

**Roads.**—Where railways are wanting in Italian or Austrian territory, it may generally be taken for granted, that good roads are available; but in Montenegrin, Turkish, or Greek territory the reverse will be the case, especially with the two former.

**Steam-ships.**—The numerous lines of steamers render water communication easy and frequent over the whole extent of coast embraced in this volume, and, so far as the rugged eastern coast of the Adriatic and the Turkish, Montenegrin, and Greek sea-boards are concerned, make ample amends for the want of intercourse by land. The principal ports are Brindisi, Ancona, and Venice, in Italy; Trieste, Pola, and Fiume in Austrian territory; Corfu, Zante, Vostitza, Patras, and Kalamata in the Kingdom of Greece. Four large steamship companies—the Peninsular Oriental, Austrian Lloyd's, Florio-Rubattino, and the Italian Steam Navigation Company, besides the Leyland, Burns and McIver, and many smaller ones,—supply convenient means of transit between these ports, the islands, and the innumerable smaller ports, as will be seen in the detailed description of these places. The eastern coast of the Adriatic and the Turkish and Greek ports are specially well served by the Austrian Lloyd's steamers, and by small local steamers which call at all the islands off the Dalmatian and Croatian coasts, as well as at the small ports on the mainland.

**Telegraph.**—Telegraphic communication is universal in Italian and Austrian territory, all the principal islands being in connection with each other and with the mainland by cable, as are also Corfu, Cephalonia, and Zante in Greek waters, the latter communicating also with Malta and with Taranto in Italy. Telegraph offices will also be found at all Greek ports of the least importance. Prevesa and some of the principal Turkish ports are also in telegraphic communication with the interior.

The following telegraph offices on the sea coast are open all night:—Ancona, Bari, Brindisi, Cattaro, Corfu, Giulianova, Gravosa, Kalamata, Nabresina, Otranto, Patras, Pola, Ragusa, Rimini, Spalato, Trieste, Valona, Venice, and Zara. Those offices open until midnight are:—Abbazia, Amphissa, Argostoli, Barletta, Cephalonia, Chalcis, Corinth, Gallipoli, Lepanto, Leucadia, Marano, Missolonghi, Naupaktos (Lepanto), Pesaro, Trani, Vostitza, and Zante.

**Semaphore or Signal stations.**—On the Italian coast, semaphore stations are generally (but not always) painted in black and white chequers. Vessels can communicate with the semaphore stations by means of the International Code of Signals, and a passing ship can communicate with its owner or receive a message from him by the same means. Payment is made according to a fixed tariff. *See* International Code of Signals.

The working hours are, as a rule, from sunrise to sunset, but should vessels be in sight the hours will be extended until such vessels are no longer visible; the hours are also extended should there be any special technical, military, commercial, or private reasons.

**Submarine cables.**—On the coast of Italy the landing place and first direction of submarine cables are marked by two beacons in line; as a rule the beacons are posts, each surmounted by a framework painted white, one of which having the letter **T** on it painted black. There is also a board where each cable is landed, with notice that anchorage is prohibited near the cable.

### **Regulations for anchorage of Foreign vessels in Italian ports:—**

1. Ships of war belonging to friendly nations are permitted to anchor anywhere on the Italian coast, subject to the following restrictions, and to the retention of the power to prohibit, if necessary, their approach in conformity with the Law of Nations.
2. Foreign men-of-war are not allowed to remain at Italian fortified ports for more than eight days, neither are more than three war-vessels of the same nationality to assemble at any one of the aforesaid anchorages, unless formal permission has been obtained from the Italian Government through a diplomatic channel.

Foreign war-vessels may also, when considered necessary, be forbidden to pass through, or to stay in, any place within the territorial waters of Italy.

3. The fortified Italian ports included in this volume are:—Venice, and the anchorages of the lagoon.
4. Foreign war-vessels anchored at the aforesaid places must leave when requested by the Royal Government, even if the specified time from their arrival has not elapsed.

**STANDARD TIME.**—The standard time kept in Italy and Austria is mid-European, namely, that of the meridian of long. 15° E., or one hour fast on mean time of Greenwich.

The time used throughout Greece is that of Athens, or 1h. 34m. 53·7s. fast on Greenwich. In European Turkey the time used is that of Constantinople, or 1h. 55m. 56s. fast on Greenwich.

**TIME SIGNALS,** by which vessels can ascertain the errors of their chronometers, are made at mean noon of the meridian of long. 15° E. from Greenwich, at Venice, Fiume, Lussin Piccolo, Pola, and Trieste. For particulars, *see* under the respective ports.

**STORM SIGNALS.**—The following storm signals are in use on the coast of Italy:—

1. By day, a cylinder; by night, three *vertical* lights, one *red* between two *white*, will indicate: "Probability of strong winds, without specifying the direction."
2. By day, a cone, apex up; by night, three *vertical* lights, one *red* over two *white*, will indicate: "Probability of strong winds from the northward."
3. By day, a cone, apex down, under a cylinder; by night, three *vertical* lights, one *red* under two *white*, will indicate: "Probability of strong winds from the southward."

The distance between the lights is 13 feet.

**CLIMATE.**—The climate of the coasts described in this volume is generally agreeable and salubrious, though at times the heat in summer is excessive; and, during the summer and early autumn months, anchorages near low and marshy lands, especially salt marshes, are to be avoided, low fevers being then very prevalent in their neighbourhood. In winter, the changes from fine weather and a moderate temperature to storm and intense cold are sometimes very sudden and trying; these changes are attributable to the mountainous nature of the country contiguous to the coasts. The subject of climate in these seas is, however, inseparable from that of wind and weather as will appear on perusal of the following pages on those subjects.

**WINDS AND WEATHER.**—The navigation of the seas and coasts comprised in this volume are simple and easy in a steam-vessel, but the near neighbourhood of high mountainous land in nearly all parts of it has a tendency to make the winds very baffling and uncertain even in fine weather, and to cause heavy local gales and squalls to be both frequent and dangerously sudden; consequently, in a sailing vessel extreme care is required, especially in the Adriatic, where a vessel is so liable to be caught in a gale without sea room, especially during winter. During summer, the winds are light and variable, with frequent calms and occasional squalls from the northward; in winter, in the Adriatic, they are almost always northerly or north-easterly, or else south-easterly with thick fogs and rain.

The winds are very variable at the mouth of the Adriatic, but are steadier in the middle of the sea; they are still more variable at its northern extreme in the gulfs of Venice and Trieste, where it is not unusual, especially near the Po, or Trieste, to see vessels steering towards each other with exactly opposite winds.

Southward of the Adriatic the winds are less variable, and in fine summer weather, and often in winter, land and sea breezes are usual. The prevailing summer wind is between W.S.W. and N.W. and belongs to that atmospheric column which traverses the whole length of the Mediterranean from the strait of Gibraltar to the coast of Palestine, backing southward of its normal direction during the day and veering northward of it at night. Storms are not frequent and are of short duration in summer, but much more frequent during winter when north-westerly gales sometimes last 3 or 4 days. The winds as they affect the navigation of the coasts of the Morea are more fully treated of at page 270.

**The weather** is exceedingly unsettled along the eastern shore of the Adriatic, between the gulfs of Trieste and Cattaro; in summer, calms, thunder, waterspouts, and the hot wind which the Slavonians call *Youg*,

are frequent; and, in winter, heavy northerly blasts of the *Bora*, with thick fogs and squalls.

From a meteorological journal kept at Venice for five years, it appears that at the head of the Adriatic, southerly winds are most frequent during the summer months to September; that the wind is seldom from the northward between April and July; that it is generally variable during fifteen days of each month of the year; and, that about twenty days of fine weather, with light breezes or calms, may be depended on in any month of the year. The rain-gauge showed that 32 inches of rain fell annually, of which 4 inches were in September, and  $6\frac{1}{2}$  inches in October, January, February, May, and December—periods at which southerly winds are not very frequent in the upper part of the gulf. The range of the barometer was but small throughout.

**Barometer.**—The indications of the barometer should be consulted in navigating these waters. The mercury usually rises with northerly winds and falls with southerly or south-easterly winds. The *Bora* generally produces a momentary depression in the mercury; sometimes this fall is very slight and far from adequately announcing the coming storm. Mariners should therefore be on their guard when it falls, though but little, especially if the fall be accompanied by the appearances presently described as precursors of the *Bora*.

**WINDS OF THE ADRIATIC.**—The most frequent winds in the Adriatic are from between N.E. and E.N.E., and from between S.E. and South. The former are the more severe and require constant and careful attention; the latter, although less dangerous, are troublesome on account of the sea they raise and the rain which accompanies them. Winds from S.W. to N.W. blow occasionally, but are less frequent than those from between S.E. and N.E., and the duration of westerly to that of easterly winds may be considered as one to three.

Winds from the southward, and especially from the south-eastward, are prevalent at the entrance of the sea, whilst those from N.E. and N.W., particularly in the fine season, are most common in its northern part; it often happens that fresh breezes from N.E., N.W., and S.W., are blowing in different parts at the same time.

The light breezes are generally from the eastward, as in most parts of the Mediterranean; they have the effect of mildewing the sails if the precaution of airing frequently be not taken when westerly or northerly winds set in.

**The Bora.**—The name *Bora* is generally given in the Adriatic to winds between North and E.N.E. It is dangerous and greatly feared by sailing craft as it rises suddenly and blows with violence; generally, and especially in winter, it blows with the greatest strength after a strong south-easterly gale, and is most persistent and violent on the eastern coast. Its general direction is across the Adriatic, and the limited breadth of this sea is one of the causes of the risk attending it, for a vessel, unaided by steam and unable to carry sail, may be driven rapidly towards the coast of Italy where there is but little shelter for large ships. Sailing vessels generally let fly everything to receive the first blast, then bear up to the southward for any port they can fetch or remain under bare poles until it is exhausted.

Off the gulf of Cattaro, the *Bora*, although less violent, sometimes renders it impossible for vessels to carry any sail, even when overtaken at a short distance from land; in this part of the Adriatic, on standing out at

once, the wind will very often be found more moderate and a vessel may then run for a shelter or keep at sea.

In winter, this wind is to be feared especially in Vrullja bay or cove near Makarska, at the mouth of the Narenta, and off the valley of Giuliana, Sabbioncello; it is also usually exceedingly fierce between Zuri island and Planka point, from the high land in the vicinity of Sebenico.

In the channels of the Quarnero and at the entrance of this gulf, too much caution cannot be observed. The Bora here rushes down from the whole line of the Julian Alps with such irresistible fury that it is not only prejudicial to navigation, but extremely so to agriculture, which has in some parts been consequently abandoned. The chief part of the maritime trade of Fiume, so far as sailing vessels are concerned, can only be carried on during the fine season, and the otherwise eligible haven of Porto Re is almost useless on account of the Bora. Whole districts are rendered uninhabitable, and, as not a bush nor a blade of grass can grow on the shores most exposed, local craft usually anchor off the parts where vegetation is most abundant. When Velebit Gebirge, the high mountain range of Croatia, is capped by white clouds, a sailing vessel should not venture into the Quarnero.

The Bora sometimes obliges vessels anchored in Trieste road to seek shelter under Salvore point and along the coast of Istria. It is the more dangerous in the channels amongst the islands because it generally takes vessels on the beam and there is but little room; the mariner should at all times keep under the weather island in order to be able to bear up.

It gives sufficient notice of its approach to an attentive observer to allow of precautions being taken. When small dark clouds are seen rising from the mountains of the eastern coast of the Adriatic and taking irregular directions, and large white, round, isolated clouds gather on the tops of the high mountains of Dalmatia, a Bora may be shortly expected, and it will continue to blow until the former disappear and the latter no longer adhere to the land. As a general rule, the clouds only leave the sides of the mountains when the wind loses its force and is about to cease.

The barometer is no positive guide, though it generally falls slightly on the approach of a Bora and at times corresponds with the violence of the coming wind, yet it generally rises during the gale. If to the fall of the mercury are added any of the indications above mentioned there should be no hesitation in taking every precaution that prudence may suggest.

The heaviest Boras are at times announced some hours before they burst, by a dense black cloud on the north-eastern horizon, with light fleecy clouds above it; a rather lurid sky, and an unusual stillness of the atmosphere. The general direction of these gales is from between North and N.E., and their ordinary continuance about fifteen or twenty hours, with heavy squalls, thunder, lightning, and rain at intervals. The Bora most to be feared is that which, after blowing in sudden gusts for three days, subsides, and then returns for three days longer.

It generally dispels any hovering clouds or fog, and when it blows with great force the weather is very clear, a few small round clouds moving rapidly being alone visible. If the atmosphere should not be cleared after 24 hours, the wind will probably continue a long time, or a south-easter will spring up. In winter it is frequently accompanied by thick fogs and snow, causing excessive cold, and is then most persistent, sometimes blowing, for nine, fifteen, or even thirty days, with short intervals of calm, during which it is not prudent to make sail. It usually comes on at the rising or setting of the sun, abating, or frequently ceasing, at noon or

daybreak ; but should it continue in force at these times it may be expected to last a considerable time.

The Bora often succeeds a slight fall of rain following a long drought ; should it not blow in such a case, south-easterly winds may be expected.

In summer, it is called the *Borino* and it then seldom or never lasts longer than three days and is usually moderate ; if it increases in strength, it is generally for a short time only, and after a great deal of rain ; it has, however, some difficulty in rising as long as the mountains of the eastern coast are wet with rain ; if it then occurs, it is of short duration and the force is generally in proportion to the dryness of the land. March, the end of May, and especially the early part of June, seldom pass without a gale.

As examples of the extraordinary violence of these summer Bora gales and squalls, it may be well to give two instances of actual experience as described by the late Admiral W. H. Smyth when in command of H.M.S. *Aid*, on surveying service. "A very hard summer Bora which I experienced in Lissa harbour on the 13th July, 1819, occasioned a fall in the barometer from 30·15 inches to 29·77 ; it was precursed by the usual denseness near the horizon, with a fresh S.E. wind ; and during the two preceding nights—although the weather was fine—there was much lightning in a vast cloud-bank which had formed. On the third evening, this bank spread over the sky to the zenith, and the coruscations became incessant ; whereupon, as we were lying at single anchor, prepared for going to sea, we dropped the best bower, braced the yards to the wind, &c. In the midst of the ærial commotion, at about one in the morning, the gale suddenly chopped round from S.S.E. to N.N.E. with such fury as to make the ship heel over in an extraordinary degree, and the cables were veered out until she was uncomfortably close to the Marina. It was fortunate that we were in so excellent a port, for the sudden shift of wind must have been injury to any vessel, under sail, however well prepared. In about an hour the acme of its force somewhat abated, rain fell in large drops, and for two days afterwards we had cool breezes from the North and clear weather."

"Shortly afterwards we underwent another of these blasts, of which I particularly noted the advent, progress, and termination. On the 9th August of the same year, while moored with the stream and small bower in the perfectly land-locked harbour of Lussin-Piccolo, the morning was suspiciously cloudy, although the preceding evening had been remarkably clear overhead . . . . On the morning stated, the wind was in the south-west quarter, the clouds lurid, the atmosphere dark, and the whole celestial aspect so singular and threatening, that notwithstanding our apparent security, I ordered the top-gallant and royal yards on deck, top-gallant masts to be struck, the best bower to be ranged, and the sheet cable bent. In the afternoon, the horizon from North-west to North was as black as possible, and the gloominess of its appearance was contrasted by a bed of white fleecy clouds which rose immediately above it and soared rapidly till they joined a series of waved distinct streaks overhead, forming an immense arch from W.S.W. to E.N.E. with a deep blue sky on each side. In a few minutes a strong wind had evidently arisen in the North-west, as it blew the clouds right and left, though we still felt the south-wester even stronger than in the morning."

"The scene was now awfully grand ; masses of cloud were in motion from the zenith downwards, excluding by degrees the brassy sky, while a momentary stillness was but a presage of the coming storm. At this time

all the fishermen were making for the shore, and the whole Marina resounded with the shouts of people endeavouring to rouse up their vessels on the strand. At length large drops of rain plashed down and the whole atmosphere seemed to resolve itself into black smoke, while the north wind was seen approaching by the eddies of sand which it threw up before it. The gust now reached the ship, roaring tremendously, with such force that both our cables were snapped like twine, and before we could bring up with the best bower and sheet anchors, veer to 40 fathoms, and brace the yards by—which was effected with a celerity that delighted me—the ship was nearly thrown upon the quay. The rain now poured a deluge, and the apparent mill-pond of a harbour was soon covered with long rolling waves, the crests off which were cut off in foam. Every boat in the port was either swamped or capsized; oars, rudders, and thwarts were floating on every side, and the vessels along the marina were driven one upon the other. Such a gust, if it had continued, must have destroyed the place; but, providentially, its excess of violence lasted only a few minutes, and in less than an hour all was restored to comparative tranquility. Among other disasters, we noticed the destruction of a small local craft astern of us; she had escaped the first blast with being merely thrown on the mud, but after she was aground, the rain falling on her cargo of unslacked lime occasioned her conflagration, and loss of sight to some of her crew. The mischief done on shore was much greater than that afloat; numbers of trees were torn up by the roots, the roofs of houses blew away like chaff, windows and doors were forced in, and even floors were displaced by the wind getting into the lower stories.”

“The crew of two of our boats—the gig and cutter under the charge of the able master, Mr. Elson—which were capsized outside the harbour at the very commencement of the Bora, though within a few feet of the land, were obliged to lie along the ground on gaining the shore, and grasp the brushwood while the main force passed over them; the masts, oars, sails, and arms of these boats were lost, together with some of the surveying instruments. In the morning the barometer stood at 30·05, and after the rain, at 29·91 inches; the Bora, though a summer one, was pronounced to be the severest which had happened in the memory of the oldest inhabitant.”

**The Sirocco.**—The South-easterly or *Sirocco* winds are common throughout the Adriatic; they are usually steady and are only reputed dangerous on account of the heavy sea, thick fogs, and rain which accompany them; when they occur in winter the land is entirely concealed from view. They are frequently succeeded by a fresh north-westerly breeze.

The indications of an approaching Sirocco are, a very perceptible mildness of the atmosphere, even in winter, and dark clouds settling on the summit of the islands and lofty mountains of the eastern coast; these signs occur some time before the wind commences, and it then generally extends gradually over the whole sea. A swell from the eastward often precedes it, and at times lasts after the wind has ceased; this swell, and an increase in the strength of the regular current setting north-westward along the eastern coast, with a rise of the sea above its ordinary level, are sure signs of an approaching south-easterly wind.

The barometer always falls with a south-easterly wind, and, generally, with all winds from the southward; when it continues to fall with the indications described, a south-easterly wind may be expected to blow with

great force. If after continuing some time the wind should die away and be succeeded by a calm, or by variables, and the signs above mentioned continue, a renewal may be soon expected.

The Sirocco is more frequent in winter than in any other season, generally blowing alternately with the Bora; between the two winds, there is nearly always an interval of light variable winds. It commonly lasts three days, and very seldom beyond nine days in winter. It comes on by degrees and only blows with violence after thirty-six or forty hours' duration; as its direction is right up the Adriatic, the sea gradually increases, the clouds become heavier, rain falls in abundance, and the weather becomes very foggy, especially in October, November, December, and January.

Sailing vessels near and outside the islands of the eastern coast may be in danger, should the south-easterly wind subside immediately after blowing hard and leave a heavy sea, which often occurs in the evening. In this locality, shelter should be sought when clouds are seen gathering on the summits of the islands. The eastern coast between Ragusa and the gulf of Drin is also dangerous, and especially so off the gulf of Cattaro. On the whole of the western coast and along the Venetian shore, where no shelter whatever is found, the sea breaks heavily.

In summer, the south-easterly wind is never strong, and towards the middle of the Adriatic it generally alternates with light easterly or north-westerly breezes. In the season, should the clouds which collect on the summits of the islands, particularly Lissa, become detached and rise in thick globular masses, a north-westerly wind may be expected to succeed.

When south-easterly winds die away in winter, spring, or autumn, they are generally followed quickly by those from West and North-west to North, which bring fine weather.

**The Siffanto.**—Besides the Bora and Sirocco, which are the two principal winds in the Adriatic, the South-west or *Siffanto*, and southerly winds, prevail occasionally. The south-westerly wind is frequently violent but does not last long; it sometimes shifts suddenly to South-east; these sudden changes are very dangerous in the vicinity of the mouths of the Po, where they always occur in strong squalls, called *Furiani*, with a heavy sea.

A southerly wind is often preceded by the same signs as a south-easterly wind and it also gives rise to a high sea. Southerly and south-westerly winds are but little felt among the islands, which afford protection from them; and, when they are light in the offing, calms are nearly always to be found within the islands. They do not last long and are generally succeeded by westerly and north-westerly breezes.

**The Maestro**, or North-west wind, is of rather frequent occurrence in the Adriatic, but mostly during summer, on the western coast, and in the northern part of the sea; it is always followed by south-easterly winds. When it occurs on the eastern coast, it generally rises about midday, subsides towards evening, and is commonly succeeded by land or by variable winds, which, in fine weather, sometimes continue after sunrise.

In the fine season, a strong north-westerly wind occasionally succeeds a south-easter along the western coast, but it abates at night and during the morning, is generally followed by light land breezes.

Winds from North-west, North, and West do not raise much sea, and they always enable vessels to leave the Adriatic.

**LOCAL OBSERVATIONS on the Winds of the Adriatic.**—At the entrance of the Adriatic the prevailing winds change with the seasons; being generally from South, S.E., and West, in

autumn and winter; and, from N.E. and North in spring and summer. The latter may last for some time, but very seldom more than three successive days. Westerly winds, though often blowing hard, with rain in winter, are not to be dreaded, as good shelter from them can be found. Easterly and northerly winds sweep over the mountains of Epirus, which in winter are covered with snow, causing intense cold. Those from the southward produce a suffocating heat, rendered still more disagreeable by rain and thick fogs.

**Entrance.**—The entrance of this sea is liable to very sudden gusts, and when it continues to blow hard the sea is short and confused, subsiding however with the wind.

**Eastern shore.**—On the eastern shore of the Adriatic, from the gulf of Drin to the gulf of Quarnero, the Bora blows almost constantly in winter with considerable violence. South-easterly winds, accompanied by thick fogs and rain, prevail on this shore during the autumn and often render impracticable any approach to the gulf of Cattaro and the adjacent shores.

Land breezes of variable strength are common at night on the eastern shore during the whole year, and at the entrance of many ports continue for a long time after sunrise.

In the neighbourhood of the Narenta, when the clouds, which generally cover the top of mount Bukavac, rise and break, the Bora may be confidently expected with hurricane strength; if these clouds are scattered in the sky, the Bora is already blowing near the land, though it may not have reached the offing. Very intense cold is experienced in winter in this part of the Adriatic on the approach of the Bora.

A curious phenomenon which occurs in the mountains of Montenegro may here be noted. In the most steady season of the year, in the finest day, and with the purest atmosphere, when not a speck of cloud is perceptible, thunder is heard among the mountains, and it is observed that at these times all the rivulets and springs in the neighbourhood discharge a greater quantity of water than usual.

In the gulf of Quarnero, the Bora is the prevailing wind; there, more than at any other part of the eastern shore, it renders navigation very dangerous, and between cape Promontore and Unie island it gives rise to whirling gusts and a heavy sea. It sometimes blows furiously in the Morlacca channel, along the Croatian coast, and as far as the middle of the gulf, while there is a dead calm at the islands at its entrance and in the offing. It is easy to know from the appearance of the Velebit Gebirge, the high mountain range of Croatia, whether the Bora is blowing or about to blow in the Quarnero gulf. When the summit of this range is covered with large whitish clouds and small dark clouds are seen to rise from the gorges, every possible precaution should at once be taken against a gale.

The Bora, or Borino as it is then called, is less violent in summer; it abates chiefly at the entrance of the channels in the vicinity of the coast of Croatia, where it is followed by a light breeze from the eastward which blows until about 9 o'clock in the morning; then, after an interval of calm, the wind sets in from the north-westward until evening, and so on during nearly the whole of the fine season.

In the gulf of Quarnero, the dark clouds which precede easterly winds gather first on the summit of mount Ossero, at the northern end of Lussin island, then on Maggiore and Velebit mountains, after which they gradually cover the lesser heights. In the winter, the Bora and the Sirocco sometimes contest violently for the mastery in this gulf; caution is therefore

requisite in the navigation of these waters, and with south-easterly winds, even if blowing hard, any signs of the Bora must be carefully watched.

The Bora is almost constant in winter on the coast of Istria, where it sweeps along the shore. It is almost impracticable in a sailing vessel to take a harbour while it lasts, for on approaching land it is generally found to blow out of the inlets.

South-easterly winds, in winter, become more southerly on reaching cape Promontore, but close to the land, along the western coast of Istria, they will be found to draw eastward.

South-westerly winds are dangerous on the latter coast, on which they blow and cause a heavy sea; although generally of short duration, the land becomes obscured, when it is difficult to take a harbour.

In summer, when the weather is fine, a light and variable breeze from N.E. to East blows almost every morning, nearly throughout the gulf of Trieste; it generally draws north-westward towards noon; then southward and so continues until evening. In this gulf, two opposite winds sometimes blow at the same time with equal force—the one northward of Salvore point, the other between cape Promontore and Rovigno; vessels should therefore always approach Salvore point with great caution if the sky be not clear in the north-east, which is a sure sign that the Bora is blowing in the northern part of the gulf.

**Western shore.**—In winter, on the western shore between Venice and Gargano head, the prevailing winds are the Bora and Sirocco, which blow alternately; if they last for any length of time, the sea rises and the navigation becomes dangerous, especially near the mouth of the Po.

In summer, on this coast, land and sea breezes prevail; they are generally light, and, close in-shore, the land wind lasts during the night and until near mid-day; the sea breeze then sets in from the southward or south-eastward until evening. On the Venetian shore, the sea breeze usually comes on feebly and gradually, but sometimes springs up quite suddenly and accompanied by thick fogs at the head of the gulf; in such a case it is of short duration.

In spring, the winds here are variable; in autumn they are almost always from the south-eastward.

South-westerly winds sometimes blow in violent squalls off mounts Conero and Gargano. Off the coast between Gargano head and cape Sta. Maria di Leuca, the Bora generally blows from the northward except in a very heavy gale; an off-shore wind is frequent at night while the Bora is still blowing in the offing.

**CURRENTS.**—A general current sets from the Archipelago along the coast of Greece towards and into the Adriatic; its strength is greatest near the shore, and its average rate on the Greek coast may be from half to three-quarters of a mile an hour, but its velocity is greatly increased by strong south-easterly winds, especially when they follow strong westerly winds which have caused an accumulation of water in the eastern part of the Mediterranean. It is also at times much stronger through the channels inside the Ionian islands.

There is, however, sometimes in the Corfu channel a southerly surface current, which is retarded or increased according to the force and direction of the winds in the offing. When it blows rather strongly from the northward the waters set southward at the rate of  $1\frac{1}{2}$  to 2 knots, and a fall of from 3 to 4 feet is occasioned. A southerly wind causes a rise of about the same amount, and the current then sets northward. This is not, however,

confined to the channel, although it is there most marked, for over the whole Ionian sea southerly winds cause a rise of about a foot, and northerly winds a fall of about the same amount; if the winds are strong and continuous, the corresponding elevation or depression is greater.

**Adriatic currents.**—The general effect of the current along the coast of Greece and among the Ionian islands is to produce a regular north-westerly stream setting through the Corfu channel along the eastern shore of the Adriatic round the gulf of Venice, and from thence more rapidly south-eastward along the western shore of the Adriatic. It is almost inappreciable in this sea beyond a distance of from 6 to 10 miles from the shore.

The rate of this current is very irregular, varying in calm weather according to locality and season; it is least in summer, when there is scarcely any current on the Venetian or Italian shores as far southward as the Tronto river, where, however, it begins to increase in strength and at times runs at the rate of 3 knots, its greatest speed being within 3 miles of the shore.

Its rate in the Adriatic is greatly influenced by its strength through the Corfu channel, where, as well as between the Ionian islands as already explained, the stream is remarkably affected by the wind, but generally sets northward. Between Corfu and cape Linguetta, its average speed is about half a knot, increasing perceptibly as that cape is neared, especially if the wind should be south-easterly.

From the great influence of the slightest change of wind on the currents of the Adriatic, it is supposed that they do not extend to any great depth; and, according to some observations, the motion of the stream does not extend vertically beyond a depth of 4 or 5 fathoms, whilst by other observations, it appears to extend to a depth of 11 fathoms.

The general drift of the current in the Adriatic is accompanied by a sufficient tidal influence to cause a variety of local sets called *ligazzi*, some of which prevail right across the sea, a natural consequence of the outline of the Adriatic and its numerous islands.

**Entrance.**—The currents are very variable and frequently strong towards the middle of the entrance, where in fresh northerly breezes they set from W.N.W. to W.S.W. at the rate of from three-quarters to one knot an hour. Along the western coast, between capes Otranto and Sta. Maria di Leuca, the current is generally strong except in calm weather and during the fine season, when the wind blows directly on this coast. In a calm, at 6 miles from the land, the current sets about S. by W. at the rate of one knot, and near cape Sta. Maria di Leuca at more than 2 knots. In fresh north-westerly winds, it soon attains a strength of 2, 3, and even 4 knots.

The westerly direction of the current at the entrance of the Adriatic may be considered almost constant; at times, however, under the influence of westerly and south-westerly winds, along the Ionian islands and as far as cape Linguetta there is an easterly set of about a knot an hour, and even more between the islets north-westward of Corfu, where, in December, it has been found running N.N.E. at the rate of 2 knots, with a smooth sea and a light south-westerly wind.

**Current on Eastern shore.**—From Saseno island, northward of cape Linguetta, the stream appears to divide into two parts, the inshore branch taking a northerly direction as far as the gulf of Drin with an irregular and often scarcely perceptible rate, but which, at times with south-easterly winds, amounts to one or  $1\frac{1}{2}$  knots. This current follows

rather regularly the coast as far as cape Rodoni, its greatest velocity being near the headlands, but in the bays it appears to be diffused. Beyond the gulf of Drin it again follows the direction of the coast.

The other branch, from Saseno island, runs generally in the direction of Meleda island, at a rate varying in calm weather from half a knot to 2 knots. When influenced by south-westerly winds, and even in calms, this current frequently sets north-eastward about three-quarters of a knot an hour. Between cape Linguetta and Meleda island a southerly direction in the current is rarely found; this is only met with westward of this line and it increases in force as the coast of Italy is approached, especially with a northerly breeze.

Off the gulf of Cattaro, the inshore current of the Albanian coast is deflected by an outset caused by south-easterly winds, which drive the water towards the coast; the two streams here produce eddies which may affect a sailing vessel, if becalmed.

Beyond Cattaro, the general current resumes its course, and, off Ragusa, being obstructed by the numerous islands to the northward, it sets chiefly W.N.W. or West.

**Inner channels.**—Among the islands, the stream is generally westerly, in the direction of their length, and is more regular in the larger channels than in the others. The rate varies according to the wind and state of the tide, which latter is considerably felt here and on the coast abreast; with south-easterly winds it sometimes attains a rate of  $3\frac{1}{2}$  or 4 knots, especially at the eastern entrances. In the narrow channels it is more rapid and variable, in consequence of the water within them with difficulty finding its level, at flood and ebb, outside the entrances.

In the Narenta channel, the current sets westward, acquiring great strength in easterly winds and when the waters of the river are swollen; when these winds fall light, the stream is observed to advance along the Sabbioncello peninsula, leaving a counter current favourable to the navigation of the channel along the island of Lesina.

In the Meleda channel, with the wind blowing hard from the south-eastward, the current runs W.N.W., at the rate of from 3 to 4 knots.

In the Curzola and Sabbioncello channels, the westerly set is tolerably regular; but south-easterly winds accelerate it, especially in the latter, which then becomes almost impracticable to sailing vessels from the westward.

The current in fine weather follows the general direction of the Brazza channel. Irregularities are produced by the off-sets of the Narenta and the Cetina, but they are of short duration.

In the Solta channel, the stream sets round and upon the Zirona islands.

In the small channel of Spalato, it is variable in force and direction.

**Outside the islands Lagosta, Lissa, &c.,** there is a regular westerly current, but on closing them it becomes uncertain. About Lissa, the set is nearly always westerly; with continuous south-easterly winds it runs with considerable strength, particularly towards the western part of the island, from whence it strikes off in a north-westerly direction, causing an eddy which renders this passage somewhat dangerous. The westerly current, in this part of the Adriatic, is accelerated by the outset from the channels of the various islands.

In light winds and calms, the westerly set is at the rate of about three-quarters of a knot an hour between Pelagosa and St. Andrea islets, but with fresh north-westerly winds, its force proportionately decreases.

Near St. Andrea and Pelagosa islets, the current, especially in winter, has no regular direction, but produces somewhat dangerous eddies; under the influence of a strong Bora in the gulf of Quarnero, it then frequently sets S.S.W. or South, turning more westward as it progresses southward. Well out in the offing at such times, near Pomo islet and between Lissa and Premuda, very irregular streams prevail; the neighbourhood of these islets should, therefore, be avoided. After passing Lissa and St. Andrea, the current apparently takes its former direction parallel with the islands and coast.

**About Planka point,** the current is always rapid and variable, and, with south-easterly winds, strong eddies are produced. From this point, and among all the islands north-westward of it, the tide is considerably felt and contributes greatly to the irregularity of the current. At 10 miles seaward of these islands, its general direction is N. by W., the rate decreasing gradually from three-quarters to less than half a knot between Grossa island and cape Promontore, and in a strong Bora it entirely ceases.

Off Premuda island, a branch of the north-westerly current flows south-westward towards Ancona and joins the south-easterly stream along the Italian coast.

Between Planka point and Zuri island, the current resumes its regularity and north-westerly direction, modified only by strong northerly winds and the set of the sea. Between Zuri island and the Quarnero it runs generally in the direction of the islands, but, in the narrow channels, the water is in a constant state of agitation, and the numerous rocks and islets in them destroy all regularity of flow.

**Inner channels.**—In the four passages between Zuri and Zlarin islands, and in the vicinity of Sebenico, the set is almost always in an oblique direction, and frequently with a velocity of 3 or 4 knots, which demands great attention. Amongst the extensive cluster of islands and rocks south-eastward of Inconorata island it is also rapid.

At the eastern entrance of Mezzo channel and in the vicinity of the Tre Sorelle islets, the current runs with considerable strength; it is regular in fine but very variable in rough weather.

In Pasman strait, it is liable to great irregularity caused by the rocks and islets; strong winds give the stream a motion inclining across the eastern entrance of that channel, and it then acquires a rate of from 3 to 4 knots.

In the Zara channel, it sets north-westward with some regularity and with a velocity at times of from 3 to 4 knots.

**Gulf of Quarnero.**—In this gulf and in the channels of the Dalmatian coast, the currents are irregular, varying in rate and direction according to wind and tide; they are also influenced by the rivers and numerous islands. Gales from the offing throw a large body of water into these channels, where it is pent up until the wind abates and then runs back with rapidity; if, on the contrary, the winds are from the northward for any length of time, the water is driven into the offing and as soon as the wind moderates returns with force.

In the Great Quarnero channel, with northerly winds, and during the whole continuance of the flood tide, a counter current will be found setting northward along Cherso island. In proceeding to Fiume, it is therefore preferable to keep that island aboard instead of the Istrian coast until in the Farasina channel. With the same winds, the southerly

current at times attains a rate of 4 knots, and, in a sailing vessel, is almost insurmountable.

During a heavy Bora, a stream sets south-westward along the coast of Istria and out of the Quarnero channel at about a knot an hour; it runs more slowly as Premuda island is neared, and takes a S.W. by S. direction; in approaching St. Andrea islet, it sets S.S.W. and South, gradually turning more westerly. During a calm night, a set of 25 to 30 miles out of the channels of these islands has been experienced.

**On the Istrian coast.**—About cape Promontore and the rocks which surround it, the currents are strong and variable. Under the influence of the Bora, they set West or W.N.W. more than a knot an hour and their effect is felt as far as Pola. Caution is therefore necessary when in the vicinity of this as well as all other projecting points on the eastern coast.

In ordinary weather, beyond cape Promontore and as far as Trieste, the stream sets slowly along the coast of Istria, strongest at Auro point, at the Marmi Grande and shoals in the vicinity of port Orsera, and at Salvore point, but its breadth does not generally exceed 2 or 3 miles. With north-westerly winds, there is a strong set towards the Brioni islands.

**Gulfs of Trieste and Venice.**—Between Salvore point and Trieste, the current turns eastward and is always felt at the latter place, where it sweeps round the bay on its course to the Venetian shore at the rate of about a knot an hour, decreasing in the offing.

In the gulf of Trieste, in fine weather, the currents are regular and their direction always southerly. At a short distance off the coast of Istria, the motion of the waters is in general south-westward or towards the Venetian shores, and is tolerably regular in fine weather but is greatly influenced by wind and tide. This irregularity is much more perceptible on the eastern than on the western coast.

During the fine season there is scarcely any current in the middle of the gulf.

The inshore current, from the head of the gulf of Trieste, always sets slowly about W. by S. following the various sinuosities of the coast. It is hardly perceptible during calms in summer or during south-westerly winds, but under the influence of the Bora it probably runs about a knot an hour.

The tides, which are very perceptible on this coast, and the rivers which empty themselves into the sea between the Tagliamento and Maestra point, have the effect of diverting the current from its usual course; the rivers also bring down quantities of mud and sand which alter the shape and direction of the banks along the coast and affect the set of the stream. At Venice, especially, the sea flows rapidly into the channels and harbours of the lagoons; in receding, the streams, in strong sea winds, give rise to wide and dangerous eddies.

The general direction of the southerly current is never destroyed, though it may be influenced by wind or other causes, and its permanence is proved by the direction and form given to the banks at the entrance of harbours and mouths of rivers.

**Current on Western shore.**—From the delta of the Po, the streams spread out eastward and then bend southward and south-eastward; in spring, on the melting of the snow, and after abundant autumnal rains, the action of the freshets is most perceptible.

From Maestra point, the current of the western coast of the Adriatic takes its general direction south-eastward. As far as Ancona, it is subject to the deflection caused by the offset from the numerous streams and rivers; its rate is never considerable, seldom exceeding a knot an hour even after the great freshets of the Po, when the sea, to a distance of 8 or 10 miles in the offing, is discoloured by the mud brought down.

In the vicinity of Ancona, and principally southward of that port, the current, deflected by the projection from mount Conero, sets eastward, frequently at the rate of one knot; but, with continuous winds from between N.W. and N.E., the rate exceeds 2 knots, and the stream may then be dangerous to vessels approaching the land for Ancona, as it sets on the St. Clemente rocks. In the neighbourhood of Ancona, the regular current of the Italian coast acquires great strength.

Between mounts Conero and Gargano head, the current continues its course following the Abruzzo coast; its rate is estimated at a knot an hour in fine weather, but it is more rapid near the shore of mount Gargano. Here the coast causes a portion of the current to branch off eastward, whilst the other part sweeps round the head close along shore and flows across the entrance of the gulf of Manfredonia without entering it. The branch setting eastward flows towards Pianosa and Pelagosa islets, and, meeting the western stream already mentioned, *see* page 19, produces rapid eddies. Around and among the Tremiti group, the easterly current is of great strength.

From Gargano head to Otranto, the inshore stream having resumed its south-easterly direction, attains its greatest rate, which is estimated at  $1\frac{1}{4}$  knots between Gargano head and Brindisi and nearly  $1\frac{3}{4}$  knots between the latter and Otranto; with northerly winds, this rate rapidly increases and sometimes exceeds 3 knots. It is generally weak in summer, especially with on-shore winds, but with north-westerly winds its strength is sufficient to require attention.

After passing cape Otranto, the current follows the trend of the coast southward and flows close round cape Sta. Maria di Leuca into the Mediterranean.

**The off-shore currents** on the Italian coast are variable in their strength and direction according to prevailing winds. Bora winds drive the water towards the Italian, and south-westerly winds towards the Dalmatian coast; whilst south-easterly winds cause an irregular curve on either side. After a strong wind has lasted two or three days, a current contrary to that previously running will always be found as soon as the wind abates and will continue until the former has resumed its usual course.

About midway between cape Promontore and mount Conero the set varies between S.S.W. and S.E. at a rate generally of from a quarter to half a knot an hour. There is little or no current during the fine season.

**TIDES.**—The Tides of the Adriatic, like those of the Mediterranean generally, are very slight and irregular, but an approximate knowledge of the rise of the tide and of the time of high and low water, may often be of use; and attention should always be paid to the various causes likely to produce irregularities in the tide of any harbour visited. At the mouths of the rivers, especially of the Po, when the waters are swollen by rains or the melting of snow, the rapid outset necessarily retards the flood stream and accelerates the ebb stream. The land should therefore be approached with caution at such times, and, if necessary, the advice of local pilots obtained.

The tidal action is scarcely perceptible at the mouth of the Adriatic ; it is first felt at Cattaro on the eastern and at Brindisi on the western coast, becoming stronger towards the northern part of the gulf.

On the shores of Dalmatia, the tides are weak and irregular ; observations show a slight range of tide in calm weather, but none with fresh north-westerly winds.

In strong south-easterly winds, there is sometimes a rise of from one foot to nearly 2 feet ; and, in the channels and narrow passages between the islands, a rapid tidal stream of short duration is produced.

The tidal stream off the coast of Istria has been found to set against north-easterly winds at the rate of nearly a mile an hour and then return to its south-easterly course ; and, at times, the effect of the ebb stream causes an apparent stillness of the offing and central waters.

On the western shore, the rise varies from one foot to nearly 4 feet at springs, and according to local circumstances and prevailing winds. Bora gales cause a rise along the coast of Italy ; at Barletta, Bari, Monopoli, and Brindisi, a tidal action is said to range from a few inches to 3 feet.

At Venice, with a heavy south-easterly gale, the sea sometimes rises 6 feet above the general level ; these gales render the lagoons unapproachable and the channels unsafe ; northerly winds cause a fall sufficient to uncover the mud of the lagoon.

A mean of 5 years' observations at Venice, according to Professor Toaldo, gives a rise and fall of 2 feet at springs ; also the approximate establishments of the ports of Malamocco and Chioggia at 10h. 30m. ; and, of Venice, at 11h. 15m.

In the Ionian sea and on the coast of the Morea, the tidal action is quite unimportant except at the entrance to the gulfs of Arta and Corinth, where both flood and ebb streams at times attain a speed of 3 knots.

**NAVIGATION of the ADRIATIC.\***—These remarks apply chiefly to sailing vessels, as steam ships will, in most cases, take the direct route.

In the navigation of the Adriatic, as with other narrow seas, local knowledge and experience are of great value. In winter, the chief difficulties arise from the frequency of thick fogs and boisterous winds, from the narrowness of the sea, and, on the western coast, from the want of shelter in bad weather. As a general rule, the eastern side is to be preferred, both in passing up and down the Adriatic, notwithstanding the disadvantage of adverse currents in the latter case. Under favourable circumstances in the summer season, well-found vessels sailing southward may venture along the western side. Here, however, in uncertain weather, a sailing vessel can seldom reckon upon reaching shelter from a sudden gale, and great risk is incurred if surprised by one in the vicinity of the shore ; whereas, on the opposite shore, there are nearly everywhere good ports or places of shelter, especially from the Bora.

In a sailing vessel the greatest possible vigilance is necessary to avoid being caught unprepared by a Bora ; and at the slightest premonitory symptoms, no time should be lost in seeking the nearest place of refuge, as the violence of the gale may drive a vessel westward and reduce her to the necessity of anchoring on the open Italian coast with bad holding ground, unless she can reach the anchorage at the Tremiti islands, or that in the gulf of Manfredonia south-westward of Gargano head, either of which afford good shelter to a vessel so overtaken.

The navigator should be on his guard also against the Sirocco or south-easterly wind, which, when violent, is dangerous in some parts of

\* See Admiralty Passage chart, 1,078 [3,512] ; also " Ocean Passage." General chart, 1,440 [789].

the Adriatic; but, as it generally gives ample warning and invariably comes on gradually, there is usually sufficient time to secure shelter under the islands.

**Making the Land.**—It is customary for vessels bound to the Adriatic from the Mediterranean, to endeavour to make Corfu island, which, being high, is visible at a considerable distance. Approaching from the westward, the mountains of Epirus are first seen, then Corfu and its islands, forming a long chain of small regular hills. The monastery crowning mount St. Salvador, at the northern part of Corfu, is a good mark. The island may be boldly approached and a course steered westward of Fano islands for cape Linguetta, the eastern point of entrance to the Adriatic.

Sometimes cape Sta. Maria di Leuca is sighted, but occasionally the landfall is farther westward on the Italian coast. Cape Sta. Maria di Leuca is easily recognised, being 520 feet high and projecting south-eastward; when viewed from the southward, it presents a steep rocky face, precipitous at its foot; seen from the south-westward and westward, it terminates seaward in a slope of about  $45^\circ$ ; when approached from the south-eastward and eastward, the slope is more gradual. On its summit are a chapel, a white signal tower, several houses, and, near the extreme of the cape, a white lighthouse.

In making the land with south-easterly winds, which usually bring thick weather, it is difficult to distinguish the coast of Italy even at a short distance; it is then best not to make the land westward of cape Sta. Maria di Leuca, as the shore should not be closed on account of the foul ground westward of Pali point (Med. Pilot, Vol. II.). If the Italian coast is sighted, every effort should afterwards be made to close cape Linguetta and the Albanian coast, especially in the bad season.

The chances of favourable or unfavourable winds on entering the Adriatic depend on the time of year; thus, in the autumn and winter, southerly, south-easterly, and easterly winds prevail; in summer, the most common winds are north-easterly, and northerly; the latter last a considerable time but are never strong for more than 3 days.

On making the land with fair winds, viz., winds between S.E. and S.W., a course should be steered to pass about 12 miles from cape Otranto. In the winter, with strong winds, a heavy sea and rain are almost continuous at the entrance of the Adriatic; nevertheless, there should be no hesitation in proceeding, after having verified the vessel's position, as shelter may be easily found if it should become necessary.

With contrary winds, the Albanian coast should be closed to take advantage of the weatherly current, which, setting north-westward, is favourable on that coast. For a similar reason, the Italian coast, between capes Sta. Maria di Leuca and Otranto, should then be avoided as much as possible, for with such winds the south-easterly current is always rapid there.

At the mouth of the Adriatic, in the fine season, north-westerly winds are often rather fresh during the day, and vessels, if unable to beat against the current which constantly sets out near the middle of the entrance, proceed to the anchorage of port Castro. With a violent Bora, it is not prudent to attempt to enter the Adriatic in a sailing vessel; a vessel should then anchor under cape Sta. Maria di Leuca until the gale is over.

**The Albanian coast,** between Corfu and cape Linguetta, along which a vessel should work up against contrary winds, is high and bold,

offering no shelter or good anchorage; therefore, it should not be closed with too freely during winds which make it a dead lee shore, although the current would probably be favourable.

When proceeding to the gulf of Drin, Cattaro, Ragusa, &c.; after passing cape Linguetta, no remarkable point presents itself along the generally low sandy coast of Albania, except cape Laghi, the high land immediately northward of Durazzo, and that of cape Rodoni; care should therefore be taken to keep a good offing. During the first part of the course, the current, sets north-westward about a mile an hour, and north-eastward when about abreast of Durazzo.

If overtaken by a heavy gale from the southward or south-westward, which is sometimes attended with danger on this part of the eastern coast, shelter may be sought in Valona or Durazzo bays. The first of these is the easier of access under all circumstances; it is sometimes imprudent to run for Durazzo bay in a southerly gale, as the adjoining land is low and not easily distinguished in thick weather. If unable to fetch Valona bay, it is advisable to make for Rodoni roads, where there is good shelter eastward of the cape. In Antivari roads, shelter may be found on the northern side of Volovica point, which forms its south-western extreme.

The most dangerous winds between cape Linguetta and Cattaro are, the Bora, which blows from between N.E. and E.N.E.; south-westerly winds, which are right on the shore; and, with reference to making the land, south-easterly winds, which are usually accompanied by thick weather.

When between cape Linguetta and Cattaro, if the warnings of an approaching Bora gale, as described in the preceding pages, should be perceived, a vessel, if sufficiently far north-eastward, should haul close to the wind on the port tack and seek shelter under the Albanian coast in the indentation of the shore between Antivari and cape Dulcigno, or along the shore between the latter and St. Giovanni di Medua in the gulf of Drin, or, finally, in Lales bay, south-eastward of cape Rodoni. If far enough northward and sufficiently near the shore, with the Bora not too violent, a vessel of light draught, by immediately standing on the starboard tack, might reach shelter in Molonta or in Traste bay; or, if of considerable draught, in the Calamotta channel. Lastly, if too far southward to reach either of these places, she should endeavour to fetch the anchorage at Meleda, in order to avoid the necessity of running to leeward; but, it should be recollected that it is difficult to fetch into any of these anchorages when once this wind acquires more than moderate strength. In all cases, great caution must be used in navigating the Dalmatian coast.

**Cattaro.**—On approaching the high lands of this gulf, the Bora at times reaches the vessel with such violence and raises so heavy a sea, that attempts to fetch a port would be fruitless, and the most prudent course for a sailing vessel is, either to scud under bare poles for shelter in the gulf of Macedonia, or to endeavour to quit the Adriatic for the anchorage of Sta. Maria di Leuca. Sometimes when driven from under the land by the violence of the Bora, the wind is moderate at a distance of 10 miles from the coast, but even then it is advisable to seek shelter elsewhere, as there is no probability of making out the land.

**Ragusa.**—With south-easterly winds, a sailing vessel should not close the land in this neighbourhood early in the day, as morning calms and current

eddies may probably render her unmanageable. Ragusa is not a safe anchorage in a strong south-easter.

**Breno bay**, northward of Ragusa Vecchia, affords good shelter for vessels of any draught either in a Bora or with south-easterly winds, and is consequently a good place of refuge.

**Calamotta channel.**—The caution given with regard to approaching Ragusa, is applicable to vessels entering this channel from the eastward; it is generally advantageous to make Ragusa in the first place as the current sets westward along the land. When arriving from the south-eastward, the easiest and most frequented passage is that between the Pettini rocks and Calamotta island.

**Islands, &c., south-eastward of Planka point.**—The channels formed by this group are, generally, tolerably wide and less obstructed by rocks and shoals than those formed by the islands north-westward of Planka point. In ordinary weather, the currents are regular and the navigation simple. The precaution chiefly to be observed is, to keep as much as possible on the weather side of the channel with reference to the direction of Bora gales, and, therefore, with a port under the lee in the event of one rising suddenly. This caution is applicable to all passages on the eastern coast of the Adriatic.

On approaching the islands, mount Timor, 2,954 feet high, serves well to indicate the position of the entrance to the Meleda channel which commences off the western extreme of the Calamotta channel and is chiefly used by coasting vessels. In the winter season, strong currents set westward, and, with south-easterly and southerly winds, the shore of Meleda island should be closed to avoid the rough sea under the Sabbioncello peninsula; it is important not to be becalmed near the shore of the latter during these winds, which often die away towards the evening leaving a considerable swell. With the Bora, on the contrary, the coast of this peninsula should be hugged.

When the group is made from the southward or south-eastward, Cazza and Lagosta islands, the farthest from the mainland, are visible at a considerable distance and both are well lighted by night. Mount Hom, 1,237 feet high, at the western extreme of Curzola, will next be seen; then mount Kom on the same island, 1,673 feet high, and remarkable for the various shapes its summit assumes; and, subsequently, the highest part of Lagosta with its chapel; but, the most conspicuous object, from whatever quarter the islands may be approached, is mount Vipera on the mainland, 3,170 feet in height. Giuliana valley, a remarkable break in the high land of the Sabbioncello peninsula, is the best guide to the western entrance of the Meleda channel, and for the passage between Meleda and Lagostini islands.

On approaching the islands from the north-westward or westward, it is customary to make Planka point, which is easily recognised when arriving from the Italian coast. Of the islands, Pomo and St. Andrea islets are first seen, then mount Hum of Lissa, Lissa island itself, and the two Zirona islands.

**Cazza and Lagosta channel.**—If bound to Lesina, Brazza, or other channels from the southward, the passage between Cazza and Lagosta islands should be taken, or both islands should be left on the starboard hand and a course shaped for the western extreme of Lesina; this point is easily distinguished by the forts which crown the heights surrounding the town, and by mount St. Nicolo with its fort.

**Lagosta channel** is only used when bound through the Meleda channel, or on quitting the latter from the eastward. After long continued south-easterly winds, the currents are troublesome at the western entrance and southerly winds cause a heavy sea ; these winds frequently die away in the evening, leaving a heavy swell, therefore a sailing vessel must be careful to avoid the vicinity of outlying islets and dangers.

**Sabbioncello channel** is used by coasting vessels from the southward in order to keep near the shore ; they generally pass on the northern side of Torcola island, especially if the weather should appear threatening, in order to keep Porto Grande under their lee. If unable to reach this anchorage in a violent Bora, it is best to make for port Lesina.

Neither the Greco de Lesina nor Narenta channels have hitherto been much used in the ordinary course of navigation ; the improvement of the port of Narenta and the great increase of trade there is, however, causing them to be much more used than formerly, they are also frequented by coasters passing to Makarska on the mainland, or by vessels driven there by stress of weather. It should be borne in mind that after easterly winds the current generally sets eastward under Lesina island and assists a vessel when bound to the mainland. With these winds, it is advisable to give a wide berth to the Sabbioncello peninsula, along which there is no good anchorage in case of emergency.

**Spalato passage.**—Vessels bound to Spalato generally pass through this small channel. On arriving from the southward, if the wind and current are unfavourable, a vessel may proceed to port Milna of Brazza island, if far enough northward ; otherwise, in order not to lose ground, to Lesina, or if she be of light draught, to St. Giuseppe of Brazza.

**Brazza channel**, between the island and the mainland, like all others near the coast, is exposed to most violent Bora gales. The native mariners anchor every night under the mainland, and, when under way, keep near it, so that when unable to pick up an anchorage off it, they may be in a position to fetch one in Brazza island.

**Zirona and Solta channels.**—These small channels are seldom used ; in the former a very strong current always sets on the shore ; if a vessel from the westward, after passing Planka point, should take it with a fair wind on her way to Brazza channel, the Macina shoal in the western part of Spalato channel should be carefully avoided.

In the event of threatening weather from southerly winds in the neighbourhood of Meleda, and not wishing to enter a port, there is anchorage in the Meleda channel off port Mezza Meleda in about 35 fathoms, sandy bottom, at  $1\frac{1}{2}$  miles from the shore. But it is necessary to be prepared to weigh when the wind slackens, in anticipation of a Bora. Shelter may also be sought in one of the ports southward of Curzola.

A sailing vessel from the eastward overtaken by a Bora and unable to fetch the islands, should reach in on the port tack for anchorage on the Albanian coast. If signs of this wind are perceived when in the neighbourhood of Narenta, or of Makarska, the coast should be closed and anchorage sought for as speedily as possible ; but, if surprised by it, it is advisable to run for shelter at once to one of the ports eastward of Brazza. If overtaken at a few miles from the Zirona islands, the best plan is to haul close to the wind on the port tack and endeavour to fetch the Lesina channel. In the event of the wind drawing ahead, as often occurs here, St. Giorgio of Lissa should, if possible, be reached ; or, if the vessel is too far to leeward, she might fetch Comisa bay at the western end of Lissa.

In the vicinity of Planka point, the Bora varies between North and East, and, on approaching the shore, would probably be found to blow in such violent squalls as to render it impossible to carry any sail. If a Bora is encountered in the Spalato channel, and it is found impracticable to reach an anchorage in the Canale Castelli, it might be convenient to anchor under Brazza island.

**Route to the Northward.**—When proceeding to any of the northern ports, and having arrived off cape Linguetta, a course should be steered for Lagosta, on the southern extreme of which island is a powerful light, visible in clear weather from a distance of 25 miles, which is a good point of departure. Having passed Lagosta, a course should be shaped for Cazza islet, also well lighted, and, from thence to pass southward of Busi islet, or between it and Lissa; in the latter case, guard against the current which there sets strongly westward. The islands off Planka point are frequently obscured by mist during south-easterly or south-westerly winds.

This is the safest and most prudent route at all seasons; but, vessels bound to Ancona in summer, at times sight Pelagosa islet, which stands up like a column, and shows from its summit a powerful light, visible when fine from a distance of 26 miles, which, in clear weather, can scarcely be passed on either side without being seen. Pelagosa islet is 28 miles northward of the shore of Gargano head. Following this course, it is better to pass between Pelagosa and Lagosta rather than between the former and Gargano head; for, although at this time of the year the currents are usually weak, when southward of Pelagosa and after heavy rains they may be found strong.

In the vicinity of Ancona, the south-easterly set is sometimes so strong that in light winds, near the high lands, sailing vessels frequently find difficulty in reaching this port, especially if they have not made the land well to the northward.

After reaching Lissa, vessels bound to Trieste or Venice usually shape a course to pass southward of the islands of Incoronata, Grossa, &c., sighting the light on Bianche point, the north-western extreme of Grossa island, and from thence continuing for cape Promontore.

Between Lissa and cape Promontore, it is well to keep rather close to the islands in order to profit by the ordinary north-westerly current, and to keep in a position to reach one of the numerous sheltered localities in the event of a Bora gale rising. Among these the chief are:—port St. Giorgio of Lissa, on the northern side of the island; port Tajer, the open anchorage on the south-western side of Grossa, where a vessel may ride out a heavy gale; the open anchorage under Premuda; port Lussin Piccolo; port St. Pietro di Nembo, for small vessels; and the excellent anchorage of Unie channel which has sufficient space for a fleet.

When abreast of the Great Quarnero channel, be as near as possible to its entrance so as to be in a position to make at once for an anchorage on the occurrence of a Bora, the violence of which wind from this gulf is such that a vessel is sometimes unable to carry any sail, and that when the Italian coast is not a very distant lee shore. With the wind between S.E. and S.W., a heavy sea sets on the coasts of the islands between Planka point and cape Promontore, and, as the wind frequently lulls towards evening, the appearance of the weather should be carefully watched so as not to be caught too close to the shore. Besides other warning symptoms, gales from the southern quarter are preceded by a long swell from the south-eastward; in the winter season, this swell continues some time after a south-easterly wind has been succeeded by a Bora gale.

The most remarkable object first seen after passing Grossa island, is mount Ossero, in the form of a cone 1,909 feet high, at the northern end of Lussin island. When farther north, the forked summit of monte Maggiore, 4,575 feet above the sea, and the highest mountain of Istria, is seen. During sea breezes, especially from the south-eastward, or when they may be expected, the summits of the two mountains are always clouded; during land winds, and at the cessation of sea winds, they suddenly become clear.

**Cape Promontore** is dangerous in thick weather, being low and bordered by shoals; having sighted it, or at night the light on Porer rock, a mile south-westward of the western extreme of the cape, the vessel should be kept at least 3 miles southward of it until the Albaneze, or Sunk rock, has been passed, especially in light winds and smooth water, as the current is then strong and sets with eddies in the direction of the shoals. For route to Trieste, &c., see page 31.

**Islands, &c., between Planka point and cape Promontore.**—The channels formed by these islands are frequented by small craft, but their navigation is difficult and requires the greatest care, as they are narrow and have numerous rocks and shoals. The Bora blows across them and the currents are rapid and changeable. Vessels of considerable draught proceeding northward should keep outside the islands, unless bound to Zara or to Sebenico.

**Zara and Sebenico.**—When bound to either of these ports, after Planka point has been sighted, the islets abreast of Rogosnizza and Capocesto should be left on the starboard hand and a course shaped for Zlarin island.

The Bora occasionally descends from the mountain valleys in the neighbourhood of Sebenico with such violence, that even when close under the land, it is not practicable to reach any anchorage on the coast, and it becomes necessary to run for Lissa or Lesina. South-easterly winds are sometimes troublesome between Planka point and Sebenico, but, except in thick weather, shelter from these can always be reached.

When bound to Sebenico or to Vodice, the coast should be closed as much as possible, and, having passed the islets off Capocesto, a course should be shaped for one of the inshore passages before alluded to.

In proceeding to Zara from Planka point, there are four passages; of these the best and most used is the Zlarin channel, between Zmajan and Zlarin islands. It is the most weatherly, and, by taking it, a vessel is enabled to reach Pasman strait with ease and also to anchor securely in a Bora gale. In steering from the south-eastward for Zara through Pasman strait, the vessel's draught of water has to be considered. The next best passage is the Zuri channel, between Zuri and Kakan islands, though here the current is rapid and variable.

**Pasman strait**, if taken on the way to Zara, should not be attempted without a commanding breeze, especially in a large vessel, as the current often sets towards the shore at the rate of 3 knots.

**Ancona to Zara.**—Vessels bound from Ancona to Zara, between Grossa and Melada islands, make the light on Bianche point, the north-western extreme of Grossa island, which marks the southern side of entrance to the passage. When nearing the entrance, a good berth should be given to the Bacili islets and a course steered for Golac islet which should be left a little on the starboard hand, and then between Ton Mali island on the port hand and Tun Veliki on the starboard. Having passed through, steer to round the north-western point of Uglian island,

and from thence for port Zara. If a Bora gale should suddenly arise, recourse may be had to the anchorage of Tre Sorelle on the eastern side of Sestrugn island.

If it is intended to enter the Mezzo channel after rounding Golac islet, the chart is the best guide.

**Gulf of Quarnero.**—As previously explained, the currents are more affected by the tidal wave in the gulf of Quarnero and among its numerous islands, than elsewhere, owing to the narrowness of egress for its waters; at times, a sailing vessel can scarcely stem them without a fresh fair breeze. The Bora also is a source of danger, but on the whole and with proper care, the navigation of the Quarnero is not difficult and is very important, owing to the growing commerce of Fiume, and to that of Porto Re, Segna, Nona, Zara, and the islands.

There are two passages to the Quarnero channels for vessels of deep draught:—the Great Quarnero or main channel between the coast of Istria and Cherso island, which leads direct by the Farasina channel to the gulf of Fiume; and the Quarnerolo channel which communicates with all the other channels inside the islands and has its entrance between Asinello and Premuda islands.

**Great Quarnero channel.**—Vessels from the westward usually take the main passage which is well marked by numerous lights. With a flood tide and fair wind, the eastern side of the passage is to be preferred, as the current there sets northward during the whole of the flood; and, when beating up with a commanding breeze, the eastern side should also have the preference, as, in mid-channel and on the coast of Istria, the current sets south-westward. The wind veers eastward towards the middle of the channel, and draws northerly in the vicinity of the coast of Istria.

If overtaken by a Bora in the middle of the passage, it is advisable, if far enough to windward and the wind not too violent, to make for Cherso bay. Shelter may also be had in Ossero channel at the northern end of Lussin, or under the lee of cape Promontore if not too far advanced.

**Quarnerolo channel.**—The passage between Asinello and Premuda islands is about 4 miles wide; nearly midway is the islet of Gruica with its white light-tower. The Quarnerolo channel is as much exposed to the Bora as the Great Quarnero channel, but, as the southern extreme of Lussin and Asinello islands afford some shelter from the sea, vessels are enabled, except in a heavy gale, either to reach an anchorage or to close the shore. Premuda, Skada, Isto, and Melada islands, protect this channel from south-westerly winds.

**Route to Fiume.**—If bound to Fiume or to Porto Re by the Quarnerolo channel, a course should be steered for the channels between Veglia and Cherso; be prepared for a sudden blast of the Bora when abreast of the passages south-eastward of Arbe island. In the narrow parts of the channel between Plaunick, Cherso, and Veglia islands, the current varies greatly in rate and direction, and is considerably influenced by the waters of the Fiumara or Reka river. The wind is often favourable for leaving Fiume when the Sirocco prevails on the other side of the passes.

**Bocca di Segna** is generally taken when bound to port Segna or Zeng or to port Novi on the coast of Croatia. In this passage the current between Veglia and Pervicchio islands is at times strong and the Bora so fierce and sudden in its approach that, even with a fair wind, it is prudent to keep under snug canvas. If unable to get through this pass, a vessel may anchor at port Veglia or in the Barbato channel on the south-western side of Arbe island.

**Pago channel** is usually taken by vessels proceeding by the Morlacca channel. Carlopago is the only town of any importance on this part of the coast. If bound to Jablanz, Arbe island should not be too closely approached in rounding its south-eastern end, as a rocky one-fathom bank lies 3 cables from its south-eastern point.

**Morlacca channel** is only used by coasting vessels, which, in the bad season, secure every night. Squalls from the high lands bordering it are dangerous, and there is no good anchoring ground along the rocky Croatian shore. Nona, on the mainland, is a town of but small importance; vessels reach it by the New Poveljana channel between Pago and Puntadura islands.

In quitting the Quarnero, no difficulties present themselves, as the wind generally, and the currents frequently, are favourable.

**Route to Trieste.**—After passing cape Promontore, the coast of Istria should be kept aboard, especially with contrary winds; the vessel is then in a better position for anchoring, if necessary, and the current sets northward when within a short distance of the land. Along the coast, cape Brancorso, the Brioni islands, Rovigno, and numerous other towns and villages, with the several lighthouses, may be seen. Generally speaking, the weather becomes finer and the water smoother when northward of or on nearing, Rovigno. Having passed Rovigno, a course should be steered for rounding Salvore point; from thence, the whole gulf of Trieste is open and a course may be shaped for the town of Trieste.

When northward of cape Promontore, south-easterly winds frequently veer to the southward; occasionally and especially in winter, they become more easterly, in which case a Bora may be expected. The high lands of Istria should be watched, and when they begin to be clouded, a place of shelter should be sought before the land becomes entirely concealed.

Frequently vessels arriving off Salvore point with a fair breeze meet a contrary wind. In this case, if the weather is not threatening, it is advisable to stand to the northward on the starboard tack, when the vessel will probably break off and lay well up on the opposite tack. The lead should be carefully attended to. Between Timavo and Grado, it is not safe for a vessel of moderate size to stand into less than  $5\frac{1}{2}$  fathoms water, within which depth the soundings decrease rather suddenly.

The Bora is violent in the gulf of Trieste. South-westerly and south-easterly winds, which blow dead upon the Venetian coast, are equally dangerous but not so frequent. If overtaken by a heavy Bora northward of Salvore point and unable to reach Pirano anchorage, it is best to bear up for Umago, which is well protected by Salvore point. It is not safe under such circumstances to anchor on the open coast between Salvore point and Trieste.

When between Salvore point and cape Promontore, a vessel, unable from the violence of the gale to hold her own, may anchor anywhere within about 6 miles of the coast of Istria; outside of this, there is a heavy sea in bad weather; but, in case of emergency, she may without great danger anchor as far as 18 miles from the shore between Rovigno and Salvore point, in depths of from 16 to 18 fathoms; this is preferable to the risk of being driven on the coast of Italy.

On entering the gulf of Venice at night, if a south-westerly gale should arise, it is advisable to keep an offing until daylight.

**Pilots** were formerly procured off Rovigno, and it was therefore from this place that vessels usually took their departure for Venice or for the ports of the lagoons; in consequence, however, of political changes,

of the excellent charts now in use, and of the increased number of lights, buoys, and beacons, this as an authorised pilotage station has been discontinued; but it is nevertheless prudent to sight and take a departure from the Istrian coast, where, also, favourable weather may be awaited for approaching the shores of Venice.

**Venetian coast.**—Caution is necessary in approaching this coast in sailing vessels, especially in thick weather when it is unadvisable to attempt to sight it. Vessels of too deep draught to enter the ports should not close the shore in strong south-easterly or north-easterly winds, or when a long swell is setting in. Proceeding from Istria to Malamocco, the only port in the lagoons for a large vessel, a course should be shaped to allow for the southerly set of the current near the western shore, and great attention should be paid to the soundings. At night it is not prudent to stand into less than from 6 to 8 fathoms, which depths are from  $1\frac{1}{2}$  to  $2\frac{1}{2}$  miles from the shore.

After rainy weather the currents are strong and the shoals at the entrances to the ports are affected by them. In the early part of the day, during summer, land breezes enable vessels to secure a favourable position for entering with the sea breeze, which sets in pretty regularly from S.W. or from S.E.; from the latter quarter, often suddenly and with considerable strength, and, if a long swell should then be experienced with the land hidden by fog or mist and no time for the vessel to reach her port, one of the anchorages on the coast should be taken for the short period during which, at this season of the year, a south-easter may be expected to last.

In the winter the Bora and south-easterly winds render the navigation of the coast between Piave Vecchia and Maestra point almost impracticable, and coasting vessels then pass from Gora bay to Venice by the inland channels.

In the summer it may be convenient for vessels to anchor off the Venetian shore at the distance of 2 or  $2\frac{1}{2}$  miles from the land, in a depth of from 6 to 7 fathoms, or farther off if necessary. The best anchorages are in Peloroso road off Malamocco, or off Piave Vecchia or Cortellazzo. At Peloroso road a vessel can more conveniently gain an offing on the approach of bad weather than from either of the other anchorages named. It is sometimes convenient to anchor here until daylight to enter Malamocco.

**Trieste to Venice.**—When bound to Venice from Trieste it is customary to coast along the land from Grado to avoid being set southward by the constant southerly current. For the same reason, in quitting the lagoon ports, and especially Chioggia, vessels should keep well off the land, and in a depth of not less than 15 or 16 fathoms whilst passing Maestra point and the mouths of the Po where the shoals are constantly growing out to seaward.

**Venice to Ancona.**—Between Maestra point and Rimini, the coast should not be approached into a less depth than 16 or 17 fathoms, and in the neighbourhood of Maestra point, especially, owing to the rapid extension eastward of the shoal water caused by the deposit from the various mouths of the Po, the lead should be carefully attended to and the shore not approached within a distance of 4 miles. Southward of Rimini the depth increases and a nearer approach may be made, especially when proceeding southward, for the sake of the inshore current; in calms or with land winds, a vessel may anchor, if desired, in about 11 fathoms, 3 miles from the coast.

**Ancona to Trieste.**—Cape Promontore should be sighted, allowance being made on the way for the probability of being set south-eastward by the current; from thence, the coast of Istria should be kept aboard.

**Manfredonia.**—The gulf of Manfredonia affords the best refuge from a Bora on the western coast, and would probably be within reach if a gale from this quarter should arise when south-eastward of Lissa. The high land of Gargano is an excellent mark, and as soon as the mount is seen by a vessel from Cattaro, Ragusa, &c., or by one not yet westward of Lagosta island, a course should be shaped to bring it a little on the starboard bow; but, if the gale should overtake the vessel when any distance beyond Lagosta, she would have to haul to the wind on the port tack in order to weather Gargango head. When bound from Manfredonia to the neighbourhood of Cattaro in the Bora season it is advisable to sight Lagosta island.

**Tremiti islands.**—When westward of Lissa and unable to fetch the gulf of Manfredonia, if overtaken by a Bora too violent for the vessel to keep the sea, an attempt should be made to reach the Tremiti islands; failing which, there is no resource but the entirely exposed anchorages on the Italian coast and a dead lee shore. The islands are low by comparison with the adjacent mainland, but, in weather such as is generally experienced during a Bora, they may occasionally be seen 10 miles distant. In making for the Tremiti islands, care should be taken to ensure clearing the low and dangerous Pianosa islet, which is only 50 feet in height.

On quitting the Tremiti islands or gulf of Manfredonia for the coast of Dalmatia, or to proceed farther up the Adriatic, the eastern shore should be closed with as speedily as possible, especially in the winter season. If bound westward, the passage between Pelagosa and Pianosa isles should be taken; St. Andrea and Pomo islets, and mount Hum of Lissa island, should be passed within view.

**From Trieste outwards.**—If outward bound from Trieste, Venice, or the coast of Istria, it is customary to make cape Promontore as a point of departure, especially in the autumn and winter seasons. The islands between it and Lissa should be coasted, following the directions given for proceeding northward, but, in fine weather, keeping farther from the shore to avoid in some measure the strength of the contrary current. Lagosta island or its light should be seen, and from thence a direct course out of the Adriatic may be shaped. In summer, if the weather should promise to be fine, vessels may venture to keep on the Italian shore for the sake of the southerly current.

In the winter season, on leaving Ancona, either from the eastern coast or to quit the Adriatic, the islands should be closed as soon as possible. The currents sets south-eastward during the first part of the route and more southerly near the middle. In moderate weather, and with the approach of summer, a course may be shaped northward of Pomo islet in order to sight Lissa, &c.; but, if bad weather should be apprehended, it is advisable to make at once for Grossa island and then coast along the islands.

On the Italian coast, in summer, vessels are almost always assisted by land breezes during the night and early part of the day, as well as by the currents, which are, however, feeble at a short distance from the shore; in light contrary airs, the anchor may be dropped at the distance of 2 or 3 miles from the land, anywhere between Ancona and Gargano head, and even as far as cape Otranto. As the coast is generally low, great attention

should be paid to the soundings; at night, a vessel should not stand into less than 9 or 10 fathoms, and if signs of a Bora are perceived, it is prudent even in summer to stand off at once. The Tremiti islands, or Manfredonia, may then afford convenient anchorages; or, Brindisi, if the vessel should be southward of Gargano head.

In winter, the Italian coast should be avoided as it is a dangerous lee shore in Bora gales, which are then so frequent. Nevertheless, this wind does not always blow home on the Abruzzo coast owing to the high lands which border it, and where, during heavy weather in the offing, the land breeze often prevails throughout the night.

In the navigation of the Adriatic more than in most localities, it is of importance to watch atmospheric appearances, and by attention to what has been said on this subject, the mariner may almost always observe some of the premonitory symptoms and obtain timely warning of the winds most to be apprehended.

**VARIATION of the COMPASS.**—The general direction of the lines of equal variation in the Adriatic and Mediterranean seas between the meridians of  $10^{\circ}$  and  $25^{\circ}$  East, is nearly North and South, *true*; ranging in amount at the present time, 1908, from about  $10^{\circ}$  in the western part to  $5^{\circ}$  in the eastern.

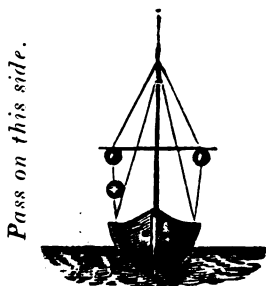
The annual decrease in the Adriatic and on the west and south coasts of Greece is about 6'.

The amount of variation for the year 1907 at various parts of the coast will be found noted in the margin where necessary.

**NOTE.**—Observations obtained during recent years show that the secular change in the variation of the compass is in some cases greatly different from what was anticipated. The results are embodied in the Variation chart for the Epoch 1907, and this chart should be consulted on all occasions before deciding on the variation to be allowed in shaping course, &c.

The compasses on the charts may be in some cases as much as  $2^{\circ}$  in error, but they are corrected if the error is in excess of that amount.

**VESSELS MARKING WRECKS.**—When light-vessels or other craft are placed to mark the position of wrecks in the ports and roadsteads of Italy, they will be distinguished as follows, in order that mariners may be able to learn on which side of them they should go:—



Vessels marking wrecks will have their top sides coloured green, and will exhibit—

**By day**—Three balls from a yard, 20 feet above the sea; two placed vertically on the side that shipping may safely pass, and one on the other side.

**By night.**—Three *fixed white* lights, similarly arranged, but the ordinary riding light will not be shown.

Mariners will thus know on sighting a wreck-marking vessel that she is so employed; and that they should pass on that side of her on which the two balls or two lights are shown.

N.B.—The Austrian, Turkish, and Greek governments have not adopted this system of marking wrecks.

**BUOYAGE and LIGHTS.**—No recognized uniform system of buoyage has been adopted by either of the governments whose coasts come within the scope of this volume, but it is safe to depend upon great attention being paid to both buoyage and lights in Italian or Austrian waters, whereas the buoys, beacons, and lights under Turkish or Greek control are less reliable.

**Light-vessels.**—The light-vessels within the limits of this volume do not carry riding lights to indicate which way the vessel is swung.

**Unwatched lights and light-buoys.**—Lights shown from buoys, and from lighthouses without keepers cannot be implicitly relied on, as if occulting the apparatus may get out of order or the light may be altogether extinguished. Sometimes the visibility of these lights is diminished by the deposit of salt, which, brought by the spray, covers the glasses of the apparatus.

**OFFICIAL NOTICES.**—In referring to Austrian Notices to Mariners the seamen should know that courses and bearings are always *true*, and that the latter are always to be considered as taken *from the ship*. Also, that the sea mile of 10 cables or 6,075 English feet is to be understood, and that Longitude is always reckoned from the meridian of Greenwich.

In Italian notices bearings given are *true* and *from the light*, unless otherwise stated in the notice.

Greek notices of lights generally, but not always, give *magnetic* bearings *from the light*.

In Turkish notices, *true* bearings *from the light* are given.

**PILOTS.—Steering commands.**—Special attention is called to the fact that the French system of steering commands is adopted in Austria, Greece, and Italy. By this system the order *Starboard* directs that the *ship's head* shall be turned in a starboard direction, and the order *Port*, that the vessel's head is to be moved in a port direction. A clear understanding should be come to with any pilots taking charge.

**Naval Dock yards and Establishments** are to be found at Pola and Venice.

**DOCK ACCOMMODATION.**—There are government dry and floating docks at Pola and Venice, but they are not available for foreign vessels, naval or mercantile, except in cases of urgent need. At Trieste there are large private establishments with spacious dry docks.

**Patent slips.**—There are patent slips at Brindisi, Fiume, and Trieste.

Particulars of the above are given in their several places; *see* also, Admiralty Dock Book.

**COAL.**—Native coal may be obtained at some of the Austrian ports; it is however generally very sulphurous and bad for steaming purposes unless mixed with English coal or used with specially constructed furnaces.

English coal at reasonable prices may be procured at any of the following ports, but, at those marked with an asterisk, being either government stores or those for special private use, coals are only supplied in cases of great necessity;—Ancona, Argostoli (Cephalonia), Bari, Barletta, Brindisi, Cattaro (Kumbor), \*Corfu, Fiume, Gravosa, \*Lissa, \*Malamocco (Venice), Methovic, Monopoli, Patras, Pola, \*Ragusa, Rovigno, Sebenico, Spalato, Trieste, Venice, Zante, Zara.\* Details are given in the descriptions of the ports named.

**Wireless Telegraph stations** are established at the following places within the limits of this work:—Ancona (mount Capuchin); Antivari\* (Volovica point); Bari\*; Cape Santa Maria di Leuca; Comisa (proposed); Malamocco; Pelagosa Grande (proposed); Venice; and Viesti. All stations are open for commercial service from sunrise to sunset, except those marked\*.

To Italian stations communication for mercantile purposes should not be made at a greater distance than 45 miles, except in cases of urgent need; the extreme limit under normal conditions is less than 70 miles. Vessels on establishing communication with a wireless telegraph station are required to signal their distance from it; when making the ship's position the longitude should be measured from the meridian of Greenwich.

Ships in distress requiring assistance should make the signal **C.Q.D.**, repeating the same two or three times at intervals of a few seconds, and using the greatest possible power.

**CONSULAR STATIONS.**—British Consuls or Vice Consuls are stationed at the following ports, viz. :—Ancona, Bari, Barletta, Brindisi, Argostoli (Cephalonia), Corfu, Fiume, Kalamata, Manfredonia, Monopoli, Patras, Prevesa, Trieste, Venice, Zante. At Lissa there is a Consular Agent.

---

General chart, 1,440 [789].

## CHAPTER II.

## CAPE SANTA MARIA DI LEUCA TO TRONTO RIVER.

**Western shore of the Adriatic.**—The coast of Italy, westward of cape Sta. Maria di Leuca is described in Vol. II. Between cape Sta. Maria di Leuca and the Tronto river, the western shore of the Adriatic sea, except the easternmost portion and the high peninsula known as Gargano head, is generally low but of easy navigation in the summer season.

Charts, 198 [737],  
2,701 [808].  
Var. 7° 5' W.

**CAPE Sta. MARIA di LEUCA** (ancient *Salentinum prom.*), the heel of what is called the "Boot" of Italy, is the eastern point of the gulf of Taranto and the western extreme of entrance to the Adriatic; it is about 520 feet above sea level, and is easily recognised from the southward by a church, a white lighthouse, and a group of houses on its summit, and at night by the light; it juts out a considerable distance to the south-eastward, sloping down gradually to the sea.

Lat. 39° 48' N.  
Long. 18° 22' E.

The shore to the westward of the cape should not be closely approached on account of Ugento shoal (*see* Vol. II.); in ordinarily clear weather the features of the coast are sufficiently distinguishable at a distance of 5 or 6 miles, but at times the land is enveloped in heavy clouds.

**LIGHT.**—On the slope near the extreme of cape Sta. Maria di Leuca is an octagonal white tower above a two-storey dwelling, the whole 159 feet in height, from which, at an elevation of 335 feet above the sea, is exhibited a *fixed and flashing white light*, which shows a *bright flash of seven seconds* duration every *half minute*, and is visible in clear weather from a distance of 25 miles.

**Semaphore.**—Upon the spot known as la Guardia, about 1½ miles north-west of the lighthouse, is a semaphore station in telegraphic communication. The building, the base of which is 397 feet above the sea, is a house with an octagonal tower, painted in black and white squares, 41 feet high; the height of the mast is 46 feet. (*See* page 9.)

**Wireless telegraph station.**—There is a wireless telegraph station near the lighthouse (*see* page 36).

**Anchorage.**—There is excellent shelter for vessels driven from the northward by a Bora, in a small bay on the west side of the cape, between it and Ristola point; south-east and south-west winds send in a heavy swell, but those between north-east and west are little felt. The best anchorage is at the entrance in a depth of 8 to 10 fathoms, sand, the church near the lighthouse bearing E.N.E. and Mozza tower N.W. by W.

Chart 198 [737].  
with plan of  
anchorage.

As heavy Bora squalls reach the anchorage, vessels, with the wind from this quarter, moor with open hawse to the northward, and a good scope of cable.

**The Coast** between cape Sta. Maria di Leuca and cape Otranto, N.N.E. ½ E. 20 miles from it, consists chiefly of well cultivated rocky

Charts, 198 [737],  
2,701 [808],  
Var. 7° 5' W.

elevations on which are numerous villages and towers; or the former, Gagliano, 3 miles from cape Sta. Maria, is conspicuous. The shore is almost everywhere bold, with soundings from 11 to 17 fathoms close-to, which increase to 36 and 54 fathoms near cape Sta. Maria di Leuca. The small bay of Castro is the only anchorage along it which affords even temporary shelter, and is easily distinguished by the town from which it takes its name; as, however, the southerly current is usually strong in this vicinity, a vessel should not close this part of the coast except when leaving the Adriatic with a commanding breeze.

The numerous towers erected at intervals for defence in former times are convenient guides for coasting vessels; the most conspicuous of these are, the semaphore, north-westward of Sta. Maria di Leuca lighthouse, already described; Novaglie tower, in ruins, and the towers of Specchia grande, port Tricase, Sasso, and Andrano, the last-named being 10 miles from the lighthouse.

Port Tricase is indicated by some houses on the beach and is accessible to boats only; in 1907 this place was visited by 17 vessels of 3,773 aggregate tonnage.

Sasso tower is about one mile north of Tricase, and, on a height above it, is the tower of the abbey of Ste. Maria di Mito.

Lat. 40° 0' N.  
Long. 18° 26' E.

**Port Castro.**—Mugurone or Maccarone point, about 12½ miles northward of cape Sta. Maria di Leuca, is steep and rocky, and projecting south-eastward, forms the port of Castro; the town stands about 320 feet above the sea and a third of a mile northward of the point; the anchorage is sheltered from northerly and westerly winds, but much exposed to those from East or S.E. Vessels anchor about half a mile south-westward of Mugurone point in a depth of 8 fathoms, mud and weeds, the town bearing about N. by E. The anchorage is used by vessels in the fine season when unable to work into the Adriatic against the current during long continued north-westerly winds.

**Water** may be obtained about a mile south-westward of the anchorage at a narrow stream which flows into the Cala dell'acqua viva, or fresh-water creek.

**Port Badisco** is a small and narrow inlet about 5½ miles northward of Castro; between them, at 2 miles from Castro, is the tower and port of Miggiano. Port Badisco has only sufficient space to shelter a few vessels of light draught, moored head and stern, from westerly and northerly winds.

The inlet trends north-westward and is in some measure sheltered from on-shore winds but exposed to those from the south-eastward, which cause a considerable sea. The place may be known by St. Emiliano tower, which stands on the coast about three-quarters of a mile northward of it; near the tower are two or three rocks above water.

Lat. 40° 6' N.  
Long. 18° 31' E.

**CAPE OTRANTO**, about 2½ miles north-eastward of Badisco, is the eastern extreme of a mass of high precipitous table land, the frontage of which is 1½ miles in extent; on the cape stands the tower of Palascia, and near the extreme point is the lighthouse rising from the keeper's dwelling, which is square. Orto point, the northern extreme of the high land, has on it a tower in a ruinous condition; southward of it may be seen the buildings of S. Nicola di Casole, and northward of it is the tower of Cucurizzo and the town of Otranto. Just southward of Orto point is Posta della Fasci, projecting more eastward and forming on its southern side a bay about half a mile deep, the shore of which is skirted by rocks above water; rocky ground at a depth of 3 to 5 fathoms extends off nearly 3¼ cables. Southward of the

rocky ground and a short half mile from the point southward of Posta della Fasci, there is anchorage with off-shore winds in a depth of 5 or 6 fathoms, sand and shells; the shoal water is steep-to, there being 25 fathoms near it.

Chart, 2,701 [808].  
Var. 7° 5' W.

**LIGHT.**—Near the extreme of cape Otranto stands a circular white tower above a two-storey dwelling, from which at an elevation of 197 feet above the sea is exhibited a *fixed white* light, visible in clear weather from a distance of 18 miles between the bearings of N. 23° E., through north and west, to S. 2° E.

**Semaphore.**—About 500 yards north-westward of the cape, near Palascia tower, is a semaphore and electric telegraph station (*see* page 9).

**PORT OTRANTO** (ancient *Hydruntum*), nearly 3 miles N.N.W. of the cape, is a bay about 4 cables wide formed between St. Nicola point on the south-east, and Craul point, which is low and rocky, on the north-west. St. Nicola point, the inner portion of which is rather high, terminates in a chain of rocks awash which afford some protection to the port against easterly winds. Le Secche, a sandbank with several rocks awash, lies about 1½ cables north-westward of the rocks off S. Nicola point, and contributes to the protection of the anchorage from northerly winds; between the two is a passage with a depth of 3½ fathoms.

Plan of port  
Otranto on chart,  
2,701 [808].  
Lat. 40° 9' N.  
Long. 18° 30' E.

The town of Otranto contains about 2,000 inhabitants and is now of little importance. It stands on a rocky site on the southern side of the bay, protected by surrounding walls and a castle. Very little trade is carried on, the only export being agricultural produce; coasting vessels are, however, constructed on the beach, and it is the terminus of the railway system communicating through Brindisi with the rest of Italy. Small supplies are plentiful, and spring water can be obtained at the north-western bastion outside the town.

The anchorage of Otranto (for small vessels only) lies between St. Nicola point, the Secche, and the town, in 3½ fathoms, weed and bad holding ground; the bottom is rocky on the north-eastern and south-western sides. North-easterly and easterly winds send in a considerable sea, but the shelter with the wind from North, round by west, to S.E. is very good. Vessels not wishing to enter the port may anchor in depths of from 6 to 10 fathoms outside the Secche.

**LIGHT.**—On **Craul point**, from an iron support over a sentry box, at an elevation of 33 feet above the sea, a *fixed* light is exhibited visible in clear weather from a distance of 8 miles; it shows *white* when bearing from N. 65° E., through north and west, to S. 65° W.; *red* from S. 65° W., through south, to S. 25° E.; obscured elsewhere.

**Telegraph cables.**—There are three telegraph cables from the shore south-eastward of the port near Orto point; one to Valona, on the opposite coast of the Adriatic; a second to Sidari at the northern end of the island of Corfu; and a third to Zante.

**Trade.**—In the year 1907, 62 vessels entered the port, of 5,816 aggregate tonnage.

**Directions.**—In clear weather, the steeple of Lecce cathedral, on a hill, 19½ miles north-west from Otranto and 6 miles from the shore, is the first conspicuous object seen by a vessel bound to Otranto from the Adriatic. When approaching from the south-eastward, the high land of cape Otranto, the several towers before described, the semaphore of Palascia,

Chart, 2,701 [808]  
with plan of port  
Otranto.  
Lat. 40° 9' N.  
Long. 18° 30' E.  
Var. 7° 5' W.

and the lighthouse below it, will be seen. After passing the cape, the buildings on the western side of the bay and then the town of Otranto and its castle will open out. The town should then be steered for; the Secche and the rocks projecting from St. Nicola point will be seen as they are neared, and with a commanding breeze from between north and east, the passage between them, having a depth of from  $2\frac{1}{2}$  to  $3\frac{1}{2}$  fathoms, should be taken, borrowing rather on the Secche side. In taking this passage, a vessel should haul up promptly to starboard after rounding the shoal, as the depth decreases rapidly towards the town.

Vessels cannot work into Otranto against westerly and south-westerly winds owing to the shallowness of the southern and south-western parts of the bay; a good anchorage in a depth of 5 or 6 fathoms, sand, may, however, be found between the Secche and Craul point, but vessels should get under way at the first symptom of a breeze setting in from seaward.

Bora gales occasion a very heavy sea in the bay, and it is unsafe for sailing craft to enter when this wind is threatening. At such a time every endeavour should be made to weather cape Otranto, and then to proceed under easy sail to the anchorage under cape Sta. Maria di Leuca.

**La Scala** is a rocky shoal 3 cables in length north and south, with general depths of from 6 to 8 fathoms, on which the sea breaks in heavy weather; the least water,  $4\frac{1}{2}$  fathoms, lies 5 cables N.E. from the lighthouse on Craul point. Vessels approaching Craul point from the northward should give the shore a berth of at least 8 cables until southward of the shoal.

**The Coast** from Otranto to near San Cataldo point, consists chiefly of rocky wood-crowned heights with richly cultivated ground, especially in the neighbourhood of Otranto; it then presents a low level outline and the country is marshy with but few dwellings southward of Brindisi; the steeple of Lecce cathedral\* is the only conspicuous object until the shore is closely approached, when a few towers, which mark the temporary anchorages of coasting vessels, become visible.

The shore is everywhere bordered by a bank which, in places, extends nearly half a mile off-shore, with scattered rocks here and there. At 3 cables from the land, the bottom is generally rock or sand; at one mile, it is mud or sand; and outside this distance, it becomes rocky with patches of mud. In fine weather, vessels may without risk coast along at a distance of one mile, taking care, however, to avoid Missipezza, a rocky shoal with as little as 6 feet water upon it, situated 5 miles northward of Otranto, and about a short mile north-eastward of Fiumicelli tower; there is a depth of 20 fathoms close outside it.

**Buoy.**—A buoy surmounted by a cylindrical top mark painted red, is moored nearly a cable outside the Missipezza; from it, St. Andrea tower bears N.W.  $\frac{3}{4}$  N., and St. Stefano tower S.  $\frac{3}{4}$  W.

**ANCHORAGES.**—It is seldom quite safe for sailing vessels to anchor off this unprotected coast; small vessels, however, do so temporarily at the following places:—

**Alimini**, a sandy bay about  $3\frac{1}{2}$  miles northward of Otranto abreast of a lake of the same name; the best berth is about half a mile from the shore in a depth of  $7\frac{1}{2}$  fathoms, with the ruins of Fiumicelli, the second tower northward of Otranto, bearing North, distant one mile. Vessels also anchor farther out in from 10 to 13 fathoms.

**Orso.**—This anchorage, 8 miles northward of Otranto, may be identified by a tower, and by a church a quarter of a mile inland. It is a small bay with a depth of 4 fathoms, good holding ground, between the tower and the southern point of the bay.

\*Lat. 40° 17' N.  
Long. 18° 26' E.

Northward of Orso tower are those of Rocca Vecchia and Specchia Ruggieri; the coast northward of Rocca Vecchia tower, and nearly as far as San Cataldo point, is bordered here and there by scattered rocks awash. Near Rocca Vecchia tower are a small church and the ruins of a few houses.

**San Cataldo** anchorage is south-eastward of the tower which stands on the sandy point of that name, and bears about E. by N. from the town of Lecce. The anchor should be let go in a depth of 3 or 4 fathoms, sand, about half a mile south-eastward of the lighthouse or tower, and rather more than 3 cables from the shore. Large vessels anchor 7 or 8 cables south-eastward of the lighthouse and nearly the same distance from the shore, in  $6\frac{1}{2}$  or 7 fathoms.

**LIGHT.**—About 66 yards from the extreme of San Cataldo point stands a white pyramidal lighthouse 76 feet high, from which, at an elevation of 83 feet above the sea, is exhibited a *fixed and flashing white light*, with a period of *ten seconds*, thus:—*Fixed light, seven-and-a-half seconds; flash, two-and-a-half seconds*, visible in clear weather from a distance of 15 miles, between the bearings of N.  $38^{\circ}$  W., through west and south, and S.  $32^{\circ}$  E.

**San Gennaro.**—About  $2\frac{1}{4}$  miles northward of San Cataldo lighthouse is Veneri tower;  $3\frac{1}{2}$  miles beyond the latter is Chianca tower; then follow Rinaldo and Specchiolla towers. Vessels also anchor south-eastward of San Gennaro tower,  $2\frac{1}{2}$  miles northward of Specchiolla tower, the depth being about 4 fathoms, mud and weeds; and, finally, about a mile southward of cape Cavallo, south-eastward of Brindisi, where good shelter from north-westerly and off-shore winds may be found in 3 or 4 fathoms, sand.

**PORT OF BRINDISI.—General remarks.—Depths.**—Brindisi derives considerable importance from its being the most eastern port in Europe, from whence the mails are embarked for India, China, Australia, &c.; it is the best anchorage for large vessels on the western shore of the Adriatic, and is conveniently situated for vessels bound to the Albanian coast or to the Ionian islands. Cape Cavallo, a low projection marked by a round tower at its extreme, and Penna point or cape Gallo,  $4\frac{3}{4}$  miles north-westward of it, on which stands a lighthouse and a square tower, form the extremes of the bay.

Chart, 1,492 [791].  
with views.  
Lat.  $40^{\circ} 39'$  N.  
Long.  $17^{\circ} 59'$  E.

The outer road is partially protected from easterly winds by the Pedagne rocks and the shoal ground connecting them with the mainland; the outer harbour and inner road is sheltered by the islets Castello and St. Andrea with their mole and breakwater. The anchorage ground in the two roadsteads extends from the Pedagne rocks in a W. by S. direction for nearly  $1\frac{1}{2}$  miles up to the entrance channel of the inner harbour, which, immediately inside the entrance and fronting the town, divides into two branches, the northern branch extending westward, the other in a southerly direction, between them enclosing the town and together forming the inner harbour.

The outer road is available for all classes of vessels, and the inner harbour is available for vessels of about 27 feet draught. Dredging is in progress to deepen the inner harbour to  $29\frac{1}{2}$  feet, and the entrance and fairway to 32 feet; see inner harbour, page 42.

**The Roadstead** is divided into an outer and inner road.

The **Outer road** is between the Pedagne rocks and Castello islet, with depths of 7 to 10 fathoms, principally rocky bottom. It is open to northerly

Chart, 1,492 [791].  
 Lat. 40° 39' N.  
 Long. 17° 59' E.  
 Var. 7° 15' W.

and north-easterly winds; easterly winds also are troublesome, but the Pedagne rocks then protect it and prevent there being a very heavy sea. The best anchorage is in a depth of about 7 fathoms, a quarter of a mile eastward of Fort Mare.

The **Inner road or outer harbour** comprises the small space westward of the Bardet buoy and Fico light-beacon, and is sheltered by the islets Castello and St. Andrea, with their mole and breakwater. The best part of this road is occupied by mooring buoys for the P. and O. Co.'s vessels, but vessels anchor on the western side, in about 5 fathoms, mud, and make use of the stern mooring shackles here mentioned.

On the north-western shore, near Caprarella, are four large shackles, at high-water mark, secured by short chains to buried anchors; these shackles are 43 yards apart, and are occasionally used for stern moorings by craft anchoring off this part.

**HARBOURS. — Outer harbour.** — St. Andrea and Castello islets, forming the eastern side of the outer harbour, are connected by a bridge; the eastern and northern sides of St. Andrea are bordered at the distance of  $1\frac{1}{2}$  cables by rocks and shallow water with 4 fathoms close outside. A breakwater connects its northern end with a point of the mainland westward, forming within it, on the south, this small and well sheltered anchorage for vessels of a moderate size, having from 4 to  $6\frac{1}{2}$  fathoms water on the islet's side, where vessels moor with a cable to the shore. The western shore of the harbour is bordered at the distance of about  $1\frac{1}{2}$  cables by a bank.

On the southern end of Castello is Fort Mare, where there is a disinfecting apparatus and rooms for a Quarantine hospital; a breakwater extends 250 yards from the fort in a S.S.E. direction.

Between the southern end of Castello islet and the end of the breakwater, the Bardet shoal, a bank of sand with patches of rocks and weed, extends south-westward  $1\frac{1}{2}$  cables, with a depth of 3 feet near its extreme, and a rock awash between it and the fort. This shoal is (May 1908) being removed by dredging.

**Inner harbour.** — The entrance to the inner harbour is at the south-western end of the inner roadstead, the passage to it being a narrow channel about 2 cables in length, with a minimum width of 360 feet; this channel and the fairway approach to it from seaward is said to have been dredged to a depth of 32 feet.

The northern and widest branch of the inner harbour is nearly a mile long, with depths of from 22 to 28 feet, shallowing towards the head; dredging is being carried on with a view of maintaining the depth necessary for the deeper class of vessels using the port. The southern arm where the bottom is mud, has been dredged to a depth of 30 feet for a length of about  $1\frac{1}{2}$  cables, by a breadth of nearly one cable, whilst the remainder of this extensive sheet of water is being deepened to 27 or 28 feet. This branch narrows and at present becomes shallower towards the head, where a dock is eventually to be constructed.

The depth of the inner harbour is said to be maintained at 32 feet wherever there are deep water quays; these quays are about a mile in total length.

**Buoys.** — A bell-buoy, red and black and surmounted by staff and cone, is moored in a depth of 4 fathoms near the south extreme of Bardet shoal.

There is a mooring buoy in the middle of the outer harbour, westward of the north end of Castello island.

Two dark red mooring buoys lie just west of the fairway of the inner road for the use of the Peninsular and Oriental Company's steamers. The outer mooring buoy bears about W.  $\frac{3}{4}$  S. nearly 3 cables from the Bardet buoy, and W. by N.  $\frac{1}{2}$  N.  $2\frac{1}{2}$  cables from the Fico light-beacon; the inner buoy lies W.S.W.  $1\frac{1}{2}$  cables from the outer.

Chart. 1,402 [791].  
Lat.  $40^{\circ} 39' N.$   
Long.  $17^{\circ} 59' E.$   
Var.  $7^{\circ} 15' W.$

**Deposit.**—About half a mile eastward of cape Gallo is moored, in a depth of 18 fathoms, a red buoy to mark where the material dredged up from the port is to be discharged.

**Dangers in the roads.**—**Secca del Fico.**—The Fico shoal extends about 3 cables, including its off-lying banks, in a N.N.E. direction from the rocky point nearly half a mile eastward of the entrance to the inner harbour, and has at its outer edge, just within the light-beacon, 18 feet water, with other foul patches between it and the shore, as also the Fontanella rock with 4 feet water, half a cable from the beach.

Part of this shoal will shortly be removed, and a breakwater built out in the direction of the light beacon (May 1908).

**Secca del' Arco.**—This rock lies in the south-western part of the outer road 3 cables from the shore, it has 19 feet of water over it, and depths of from 6 to 7 fathoms close around; from the rock, Fort Mare mole light-house bears N.W. by W.  $\frac{1}{4}$  W., distant  $3\frac{1}{2}$  cables, and Pedagne lighthouse N.E. by E.  $\frac{3}{4}$  E.

A patch of  $4\frac{1}{2}$  fathoms lies 3 cables eastward of the Secca del' Arco with the Pedagne rock lighthouse bearing N.E.  $\frac{3}{4}$  E. rather more than 5 cables. At  $1\frac{1}{4}$  cables north-westward of this patch the depth is only  $5\frac{1}{2}$  fathoms.

**A rock,** with a depth of 4 fathoms over it, lies on the western side of the fairway in the approach to Brindisi harbour, from which Riso point lighthouse bears N.W.  $\frac{1}{4}$  N.,  $3\frac{1}{17}$  cables, and Fort Mare lighthouse S.W.  $\frac{3}{4}$  W.

**Secca S. Andrea,** a patch of  $5\frac{1}{2}$  fathoms, lies northward of S. Andrea, with Riso lighthouse bearing S.  $30^{\circ}$  E., distant about 4 cables.

**The Pedagne rocks** are five low rocks covering a space of more than 6 cables in a N.W. by W.  $\frac{1}{2}$  W. and opposite direction. They extend two-thirds of a mile N.N.W. from cape Bianco, and, with the shallow rocky bank by which they are joined to that cape, afford great protection to Brindisi roadstead and harbours. The 5-fathoms line of soundings passes within less than a cable of the northern side of the rocks, but the space between them and Cape Cavallo  $1\frac{1}{4}$  miles south-eastward, is all shallow water extending northward nearly a mile from the shore, and at 7 cables East from the eastern rock is a rocky patch of 2 fathoms with two others of but slightly increased depth  $1\frac{1}{2}$  cables within them; the general depths close round these patches are from  $3\frac{1}{2}$  to 5 fathoms.

**Clearing marks.**—Fort Mare open northward of Pedagne rock lighthouse, bearing West, leads northward of all foul ground off cape Cavallo.

Small craft sometimes pass over the rocky bank connecting the Pedagne rocks with the shore. It is named the Trapanelli passage, but no more than from 4 to 5 feet water can be depended on.

**Secca Piatti.**—At 3 cables N.  $\frac{1}{4}$  W. from the tower on cape Cavallo is the Piatti rock, above water; and  $2\frac{1}{4}$  cables E. by N.  $\frac{3}{4}$  N. from the tower is the Cavallo rock. Cape Cavallo being surrounded by shoal rocky ground should not be approached nearer than a mile, nor into a less depth than 15 fathoms.

**LIGHTS.**—**Pedagne rocks.**—From a circular white tower 60 feet on height on West Traversa, the north-western Pedagne rock, is exhibited, at an elevation of 69 feet above the sea a *fixed* and *flashing*

Chart. 1.492 [791].  
Lat.  $40^{\circ} 39' N.$   
Long.  $17^{\circ} 59' E.$   
Var.  $7^{\circ} 15' W.$

*white light*, showing a *flash* every *three minutes*; the duration of the *fixed light* is *two minutes* and *twelve seconds* and the flash *six seconds*, the flashes are preceded and followed by eclipses of *twenty-one seconds* duration. The light should be seen in clear weather from a distance of 14 miles, between the bearings of  $N. 47^{\circ} E.$ , through east, south, and west, to  $N. 13^{\circ} W.$  See sketch on chart.

**Riso point.**—On Riso point, the north-east extreme of the rocks extending from St. Andrea island, stands a lighthouse, 30 feet high, from which at an elevation of 43 feet above the sea, is exhibited a *flashing white light* very *five seconds*, duration of flash *two seconds*, visible in clear weather from a distance of 10 miles.

**Cape Gallo.**—On cape Gallo or Penna point, in the north-west approach to the port, is a circular white lighthouse, from which, at an elevation of 117 feet above the sea, is exhibited a *flashing white light*, showing a *flash* of *five seconds* duration every *half minute*, visible in clear weather from a distance of 17 miles. See sketch on chart.

**Fort Mare mole.**—At the extremity of Fort Mare breakwater a *fixed green light* is exhibited at an elevation of 39 feet above the sea, and is visible from a distance of 3 miles. The lighthouse, 30 feet high, consists of a small circular tower of masonry.

**Secca del Fico.**—Off the northern side of the Fico shoal, from an iron beacon in the form of a truncated pyramid, painted black, a *fixed red light* (unwatched) is exhibited at an elevation of 32 feet above the sea. Provisional, 1905.—From the beacon Fort Mare mole lighthouse bears  $N. 52^{\circ} E.$  distant  $2\frac{1}{10}$  cables.

**Inner harbour entrance.**—From an iron pillar on Pigonati mole head at the south-eastern side of entrance to the inner harbour, are shown two *fixed red* lights, vertical, elevated 36 and 29 feet above the sea. On the opposite side two vertical *fixed green* lights are shown at similar heights. These lights, visible about 6 miles, are only seen from the outer harbour, and are extinguished should it be necessary to close the channel.

From an iron standard on Pigonati quay about one cable south-west of Pigonati mole, a *fixed red* light is shown 25 feet above the sea, visible when bearing from  $S. 34^{\circ} W.$ , through south and east, to  $N. 3^{\circ} E.$

A *fixed green* light, elevated 28 feet above the sea, and visible when bearing from  $S. 54^{\circ} W.$ , through west and north, to  $N. 76^{\circ} E.$ , is shown from the inner end of the north-west quay at a point opposite the light on Pigonati quay.

**Inner harbour.**—From an iron shed on the North quay of the town, 17 yard eastward of the Romana column and 65 feet above the sea, is exhibited a *fixed white* electric light, visible in clear weather from a distance of 5 miles.

A *fixed* light, showing *red* seawards, is exhibited from the vicinity of the Health office.

The quays forming the sea face of the town are illuminated by *electric* lamps shown from high iron columns.

**DIRECTIONS.**—The land in the vicinity of Brindisi, being very low, is sometimes difficult to recognise, especially during southerly winds when it becomes obscured, and the lead is then the only guide. Between Otranto and Brindisi, depths of from 50 to 55 fathoms will be found about 5 miles from the land until within 8 or 10 miles south-eastward of cape Cavallo, when the water shoals somewhat; on nearing Brindisi, the

Lat.  $40^{\circ} 40' N.$   
Long.  $18^{\circ} 0' E.$

bottom becomes weedy abreast of cape Cavallo; off cape Gallo there is hard mud, and between it and cape Cavallo, rock, sand, or gravel. Chart, 1.492 [701].  
Var. 7° 15' W.

The steeple of Lecce cathedral, 20 miles southward of Pedagne lighthouse is, even in clear weather, the only object which can be distinguished at a distance by vessels from the eastward or south-eastward. From the northward or north-westward, Penna tower and cape Gallo lighthouse on the extreme of that rocky point, are good guides to vessels bound to Brindisi and are the objects first seen on this low coast, which is otherwise not visible beyond the distance of 7 or 8 miles. In the vicinity of the harbour, Pedagne lighthouse, Fort Mare, and the round tower on the extreme of cape Cavallo are successively seen. *See* views on chart.

**From the north-westward**, after passing cape Gallo at a safe distance, steer for Pedagne lighthouse, taking care not to bring it eastward of a S.E. bearing and to keep cape Cavallo tower open eastward of it, to avoid the shallow water extending nearly half a mile from the shore midway between cape Gallo and St. Andrea islet, and also to avoid the Secca St. Andrea of  $5\frac{1}{4}$  fathoms,  $3\frac{1}{4}$  cables northward of St. Andrea islet.

When Fort Mare mole lighthouse bears S.W., a vessel being then eastward of the rocks bordering St. Andrea islet and in the fairway of the entrance to the port, should steer about South until the same lighthouse bears W.S.W., when the 4-fathoms rocky head in the approach will have been cleared, and the vessel may haul up for the lighthouse so as to pass about half a cable south-eastward of it, and then steer in between the Bardet black and red bell-buoy on the north and the Fico light-beacon on the south. Keep well to the westward until the lighthouse near the Romana column on the north quay of the town is well open on the south-eastern side of the harbour entrance; then steer for that lighthouse, keeping it in mid-channel and, as the Inner harbour is entered, edge rather on the north-western side to avoid the bank bordering the south-eastern shore.

**From the south-eastward**.—Approaching from the south-eastward, in order to avoid the shoal ground off cape Cavallo, cape Gallo lighthouse should not be brought northward of N.W. by W.  $\frac{3}{4}$  W., nor a less depth than 15 fathoms obtained, until Fort Mare semaphore opens northward of Pedagne lighthouse. When Fort Mare mole lighthouse bears W. by S.  $\frac{3}{4}$  S., steer for it until Pedagne lighthouse bears S.E.  $\frac{1}{2}$  E., and then steer to round Fort Mare mole-head as before directed.

**By night**, steer between the lights on Pedagne rocks and Riso point, thence between the *green* light on fort Mare mole and the *red* light on Secca Fico; and if entering the inner harbour, steer W.  $\frac{1}{2}$  N. until the *fixed white* light shown from the lighthouse on the North quay of the town is open northward of the two vertical *red* lights on Pignonati mole, bearing S.  $56^{\circ}$  W., when that light should be steered for, taking care to avoid the two mooring buoys in the outer harbour. The lights are *green* on the starboard hand and *red* on the port hand when entering the harbour.

In leaving the harbour, the North quay *fixed white* light should be kept open of the south-eastern side of the entrance channel until abreast or northward of the Secca del Fico *fixed red* light, so as to avoid the shoal ground extending from the south-eastern shore.

Vessels when proceeding through the channel to or from the Inner harbour, are required to use the lowest possible speed.

**The town** of Brindisi (ancient *Brundisium*), the scene of many remarkable historical events, has about 23,000 inhabitants. It is the see of an archbishop, but the cathedral is much dilapidated. At the north-western corner of the ancient wall which partly surrounds the town is

Lat.  $40^{\circ} 38' N.$   
Long.  $17^{\circ} 57' E.$

Chart. 1,492 [791].  
 Lat. 40° 38' N.  
 Long. 17° 57' E.  
 Var. 7° 15' W.

the old Genoise castle, unarmed, but flanked by huge round towers and conspicuous from all sides.

The town is not healthy, ague and fever being common and owing chiefly to the marshy land in its neighbourhood, especially at the head of the southern branch of the port.

Important works by draining off the superfluous stagnant waters from the vicinity are being carried out, by which it is expected that considerable reduction will be made in the prevailing malaria.

The northern and eastern sides of the town are faced by good quays, and the railway extends along the eastern side with its terminus close to the Health office. Between the Health office and a Roman column on the northern face of the town is the slightly projecting town wharf, used by the Peninsular and Oriental steamers. On the northern shore of the western branch of the port, opposite the north-eastern part of the town, is a government wharf and the quay forming the Peninsular and Oriental coal dépôt. A mooring buoy lies in this branch, eastward of Arena point.

**Communication.**—Brindisi communicates by railway with Gallipoli and Maglia southward, with Reggio and Naples westward, and through Bologna northward with the whole European system.

The through steam traffic is, also, very large and increasing. Steamers calling at the Austrian ports and at all the principal Italian ports from Venice to Genoa, including Sicily, leave twice weekly. For Greece, six times weekly. For Constantinople, Black sea ports, and Syria, twice weekly. For Malta, Gibraltar, and London, weekly. For Marseilles, fortnightly. For China, Japan, and Australia, thrice monthly (two Peninsular and Oriental steamers and one German). For India, eight times monthly (four Peninsular and Oriental, two German, and two Austrian steamers). For Egypt, frequently by all three nationalities.

For Liverpool and North American ports, thrice monthly. For North Germany and the Baltic, monthly during the export season. Also for Cette, Bordeaux, &c., occasionally.

Brindisi is the most convenient port for travellers to and from the East, and from 19,000 to 20,000 passengers land and embark yearly.

**Consulate.**—Brindisi is the residence of a British Consul, as also of consuls or consular agents for most nations.

**Trade.**—The principal imports are petroleum, sulphate of copper, dye-woods, timber, iron and metals, staves and rushes, cattle, hides, and skins, and coal, the latter being one half of the whole imports. The exports are, wine, dried fruit, wine-lees, casks, earthenware, argols, hats, and coral for India in transit from Leghorn.

The total value of the imports for the year 1907 amounted to 536,939*l.*, and the exports to 823,568*l.* In 1907, 1,483 vessels with an aggregate of 1,637,030 tons entered the port, of which only 182, totalling 14,833 tons, were sailing vessels.

**Coal and supplies.**—Coal can always be obtained in any quantity at about 30*s.* per ton, inclusive of all charges for putting it on board. Vessels of deep draught can coal alongside the quays, the depth varying from 20 to 25 feet, the latter depth being at the Pontoon wharf for berthing the largest P. & O. steamers. Coaling is usually carried on both from the quay and from lighters, from 50 to 100 tons per hour being put on board in this manner. The stock of coal on hand is generally about 15,000 tons. Fresh provisions of all kinds are plentiful. There is a large iron water boat here, and water is obtained from a fountain near the custom-house.

**Patent slips.**—There are two patent slips at Brindisi suitable, respectively, for vessels of 200 and 700 tons; they have been reported to be very much out of repair. Chart, 1,492 [701].  
Var. 7° 20' W.

**Repairs.**—A few coasting vessels are built here, certain repairs may therefore probably be effected. There are no facilities for repairing machinery.

**Semaphore.**—There is a semaphore station at Fort Mare; *see* page 9.

**THE COAST** between Brindisi and Gargano head, distant 107 miles to the north-westward of it, is generally low, mount Gargano being the only mark for vessels making the land until within 10 or 12 miles of it, when, in clear weather, the towns, villages, and towers scattered along the shores, many of them on slight eminences, may be distinguished. Charts, 2,701 [808],  
199 [790].

Between Brindisi and Barletta, about 87 miles north-westward of it, there are numerous towns, especially in the vicinity of the latter, all of which lie on the main line of railway to Brindisi, which skirts the shore the whole way, and each has a small port frequented by coasting vessels. At Monopoli, the first of these ports, the flat country disappears and the land maintains a moderate elevation with patches of cultivation, to near Barletta; beyond which, and as far as Manfredonia, sandy marshes prevail, which, together with Salpi lake, render the climate rather unhealthy. This coast may be safely navigated at the distance of one to  $1\frac{1}{2}$  miles; and, in fine weather, with land winds, even large vessels may temporarily anchor at about this distance from it, in a depth of 17 or 18 fathoms hard mud.

**Anchorage, &c.**—Although the harbours on this coast are accessible to small craft only, there are tolerable summer anchorages abreast of some of them, and a short description of these and of the various points of recognition along the shore, may be useful.

Cape Gallo lighthouse, about 3 miles north-westward of Pedagne lighthouse, is, as before remarked, a good guide to vessels bound to Brindisi from the northward. Carovigno and Ostuni,\* towns on high ground 4 miles inland, are good marks when making the land between Brindisi and Monopoli and bound for the anchorage off Villanova or elsewhere. These towns are respectively 15 and 18 miles north-westward from Brindisi. \*Lat. 40° 44' N.  
Long. 17° 35' E.

Small coasting craft which can, if necessary, haul up on the shore, anchor at a short distance from it, during fine weather, in the creeks known by the towers; among other places, westward of Penna and Testa towers; southward of Vacito tower; and, off Sta. Sabina and Pozzelli towers.

The tower of Villanova is about 20 miles from Brindisi and nearly north of the hill on which stands the town of Ostuni; the place is visited by small craft only, which anchor near the tower and close to the shore.

St. Leonardo tower is nearly  $2\frac{1}{2}$  miles north-westward from Villanova, and  $3\frac{3}{4}$  miles farther on is the tower of Canne; at  $4\frac{1}{2}$  miles beyond the latter is Egnaxia point, on which are the ruins of the ancient town of that name; then follows the tower of Cindola, close to which is a boat creek. Between this tower and Egnaxia, boats can without difficulty haul up on the shore, a convenience not afforded by any portion of the coast within 4 or 5 miles northward of Cindola tower. Lat. 40° 48' N.  
Long. 17° 33' E.

Chart, 190 [799].  
Var. 7° 30' W.

Plan of  
Monopoli on  
chart, 199 [790].  
Lat. 40° 57' N.  
Long. 17° 18' E.

St. Stefano tower is next to Cindola; at St. Stefano is a small inlet available for fishing-boats; it is 2 miles south-eastward of Monopoli and may be recognised by a large edifice on a height close to the sea.

**PORT MONOPOLI** is an inlet with three coves running in from it, rather more than  $1\frac{1}{2}$  cables deep, and rather less than  $1\frac{1}{4}$  cables wide; it is exposed to northerly winds and the holding ground is bad.

A mole, extending about one cable in a northerly direction from the castle, forms the eastern side of the port and greatly improves its small natural capabilities. At the northern side of the port a mole, to be about 320 yards in length, is under construction, of which some 200 yards was completed in July 1908. It is marked by a *fixed green light*.

Vessels that enter the port are chiefly of small tonnage, which mostly anchor close in, with a stern warp to the shore; and amongst them a few small steamers, there being weekly steam communication between it and other Italian ports. In fine weather, large vessels may anchor outside the town.

**The town** is on the main line of railway and stands amidst olive, lemon, and orange plantations, on rather higher ground; the outer portion of the walls surrounding it being washed by the sea. It contained, in 1900, a population of 22,000 inhabitants, and is defended by the castle just mentioned.

Oil, dried fruits, &c., are exported in considerable quantities; the imports are coal, grain, cattle, wood, tiles, &c.

**Consulate.**—A British Vice-consul is stationed at Monopoli.

**Supplies.**—**Coal** may sometimes be obtained, but only in small quantities; vessels can coal either at the quay which has a depth of 13 feet alongside, or at anchor in about  $4\frac{1}{2}$  fathoms; larger supplies can be procured by rail from Bari or Brindisi. There is a very good hospital available for seamen at a charge for maintenance of only one shilling per diem.

The land contiguous to the town is fertile, well cultivated, and presents a picturesque appearance.

**LIGHT.**—A *fixed white* light, elevated 50 feet above the sea, and visible in clear weather from a distance of 8 miles, is exhibited from a hexagonal red tower, 45 feet in height, on the molehead at port Monopoli.

**COAST.**—**Polignano.**—This small port,  $4\frac{1}{2}$  miles north-westward from Monopoli, is fit for boats only. The town is on a steep craggy rock surrounded by olive trees; at the foot of the rock is a spacious cave.

Between Monopoli and Polignano are Orto and Ancina towers; beyond these is St. Paolo, a rocky islet, on which are the ruins of a monastery. St. Vito tower, which has a large building southward of it, is  $1\frac{1}{2}$  miles north-westward of Polignano; beyond it is Rapagnola tower on a projecting point, and 4 miles farther is the town of Mola.

**MOLA.**—Coasting vessels anchor either eastward or westward of Mola. On the eastern side, from near the northern extreme of the town, a rocky ledge formed into a mole and connected with the shore by a jetty on piles, extends south-eastward for more than a cable; this affords shelter to small craft from northerly winds in about 6 feet water.

The town, containing with its environs about 12,000 inhabitants, stands close to the seaside on a low shore; it has but little trade.

In fine weather, vessels anchor in a depth of  $5\frac{1}{2}$  fathoms, hard mud, about half a mile off the town, which may be recognised by its cathedral and two white conspicuous steeples.

Plan of Mola on  
chart, 199 [790].  
Lat. 41° 4' N.  
Long. 17° 6' E.

No. 1539.—MOLA—ALTERATION IN CHARACTERISTICS OF LIGHT.

*Position.*—On head of mole.

*Details.*—The fixed red light has been replaced by a light having the undermentioned characteristics:—

*Character.*—An occulting green light, every seven and a half seconds, thus:—

Light,	eclipse.
$\frac{5}{5}$ sec.	$\frac{2}{2\frac{1}{2}}$ sec.

*Elevation.*—38 feet.

*Visibility.*—5 miles.

*Structure.*—Iron trellis mast, 33 feet in height.

Chart No. 199.

Med. 3, p. 49.



**LIGHT.**—From a post on the head of the mole at Mola, a *fixed red* lantern light is exhibited at an elevation of 24 feet above the sea, visible in clear weather from a distance of 4 miles.

Chart, 199 [790].  
Var. 7° 40' W.

**The coast** between Mola and Bari, 11 miles north-westward of it, is bordered by rocks and presents no remarkable features, except Pelosa and Carnosa towers. St. Giorgio cove is between the above two towers, and half a mile north-westward of its entrance is the Punta d'Oro shoal, extending a short distance off-shore with  $1\frac{1}{2}$  fathoms water. There is anchorage for small vessels off St. Giorgio cove.

**BARI.**—The town of Bari (ancient *Barium*), stands close to the sea on a low projecting point; it is fortified and well-built, is the capital of the province of Bari, with a population of 85,101 in 1906, and is the chief commercial town on the coast. It has two harbours, but the eastern one is of little use. Bari is on the main coast line of railway, and is also the terminus of the line which crosses the land to Taranto. The environs are fertile. Many ancient tombs exist here and some fine vases have been discovered.

Plan of Bari, on  
chart, 199 [790].  
Lat. 41° 8' N.  
Long. 16° 52' E.

The town is readily distinguished from the eastward by its two steeples, the highest of which is a square tower of a brown colour, surmounted by a small steeple. The castle with its two black towers afterwards appears, and then the high walls of the town.

**Consulate.**—A British Vice-consul is stationed at Bari.

**Semaphore.**—Within the castle in the new port is a semaphore station with telegraphic communication; *see* page 9.

**Wireless telegraph station.**—There is a wireless telegraph station at Bari; *see* page 36.

**Old port.**—The Old port of Bari, on the south-eastern side of the town is small and shallow; it is protected on its northern side by the town wall and by St. Antonio mole projecting eastward about a cable, and on its south-eastern side by St. Nicola mole extending one cable north-eastward from the beach, the mole-heads being one cable apart on a N.N.E. and S.S.W. line of bearing.

The entrance between the moles is open to the eastward, and for about a third of the space enclosed, near the northern mole, the depth is from 6 to 9 feet; this space is sufficient for several small vessels, which moor under shelter of the northern mole with their heads eastward and an anchor laid out in this direction, as a precaution against the heavy sea which occasionally sets in. The old port is difficult of access in strong northerly and in easterly winds; in the former, the sea washes over the moles.

In entering the old port, care must be taken to avoid a rocky shoal almost awash, named *Secca del Monte*, on which the sea breaks in heavy weather; its outer edge is more than 2 cables N.E.  $\frac{1}{2}$  E. from the end of the northern mole, and between it and the mole, for a space of one cable, the depth is from 10 to 13 feet; it is marked by two red conical buoys, placed, respectively, at half a cable W. by N. of the north extreme, and close off the south-east point. This shoal rises from the shallow rocky bank which surrounds the eastern side of the town.

**Port Bari** is formed by the Foraneo mole, a breakwater which extends from the northern extreme of the town in a N.W.  $\frac{1}{2}$  N. direction for about half its length, and then W. by N. for the remainder, forming an elbow north-eastward; its total length being about half a mile. About  $1\frac{1}{2}$  cables south-westward from the inner end of this breakwater Spagenta mole projects a distance of about 200 yards in a north-westerly direction,

Chart, 190 [790],  
with plan of port  
Bari.  
Var. 7° 40' W.

its outer end being in 20 to 22 feet water. An inner mole 612 yards in length, known locally as the Pizzoli groin, runs out in a general N.N.E. direction from the western part of the town giving protection from the north-westward to small vessels; its head is S.  $\frac{1}{2}$  E. distant 400 yards from the outer end of the breakwater.

The enclosed area forms a considerable space of good anchorage, and between its head and the landing pier are two mooring buoys. The depth from 28 feet near the head, decreases within it to 24 and 20 feet, and so on gradually to the shore. The breakwater completely protects the port from strong north-easterly winds, but it is imperfectly sheltered from the north-westward; nevertheless commerce here is very active.

**Dredging** is in progress at the entrance of, and within, the new port; the dredgers exhibit two vertical *red* lights at night. In January 1907, the depth at the Spagenta mole end was 20 to 22 feet; north-east side 22 to 16 feet; south-east side 16 to 10 feet.

**Trade.**—The imports during the year 1906, consisting of cotton and woollen goods, drugs and tobacco, metals, petroleum, grain, coal, &c., amounted in value to 2,410,307l.; the exports, consisting of wine, oil, almonds, potash, figs, vegetables, &c., to 2,393,561l.

In the same year 1,808 vessels of 1,078,680 total tonnage entered the port, of which 625 were sailing vessels of 30,994 aggregate tons.

**Coal and supplies.**—Between 30,000 and 34,000 tons of coal are imported annually, and from 10,000 to 12,000 tons are usually in stock; present price about 24s. per ton. There is no proper coaling wharf, but vessels ship coal alongside the breakwater, where there is a depth of about 25 feet.

Supplies are plentiful. Water (rain) is procurable at 2s. per tun.

**Repairs.**—There is an engineering establishment, and also several machine shops at Bari where any kind of repairs to hull, engines, or boilers can be made good.

**Communication.**—The Cunard Company have a monthly service; the Wilson Line of steamers, from London and Hull, a fortnightly; and Ellerman Line a weekly service to Liverpool, Bristol, &c. The Phelps Line calls here occasionally from New York. The Puglia Steam Ship Company, &c., call here regularly.

**LIGHTS.**—On San Cataldo point at  $7\frac{1}{2}$  cables W. by N.  $\frac{5}{8}$  N. from Bari breakwater head, is an octagonal white tower over a two-storey dwelling 205 feet high, from which is exhibited, at an elevation of 216 feet above the sea, a *fixed white* light varied by a *bright flash of fourteen seconds* duration every *two minutes*, visible in clear weather from a distance of 21 miles.

**Breakwater.**—From a masonry tower with dwelling, 41 feet in height, situated 50 yards within the extreme of the (New port) breakwater, a *fixed and flashing* light with a period of *forty seconds* is exhibited, showing thus:—*White fixed, nine and a half seconds; white flash, six seconds; white fixed, nine and a half seconds; eclipse five seconds; red flash, five seconds; eclipse, five seconds.* The light, elevated 49 feet above the sea, is visible in clear weather from a distance of 12 miles.

**South jetty.**—At the head of the Pizzoli mole a *fixed green* light is exhibited, elevated 30 feet above the sea.

**Harbour lights.**—*Fixed red* lights are shown from each of the two outer corners of Spagenta mole on the south-eastern part of the port

Lat. 41° 8' N.  
Long. 16° 51' E.

These lights open of the breakwater light afford assistance in making the port at night.

**Old port.**—A small *fixed green* light, elevated 23 feet above the sea, is shown from an iron pole on the North mole-head of the old port, visible from a distance of 2 miles.

Chart, 199 [790],  
with plan of port  
Bari.  
Var. 7° 40' W.

**ANCHORAGE.**—Vessels of deep draught may anchor in a depth of 17 fathoms, sand, about a mile off Bari, with the two conspicuous steeples of the town in line, or with the castle appearing between them. This spot is sheltered from southerly and from westerly winds, but is greatly exposed to those from the northward and eastward. Nearer the town, especially between the depths of 10 and 5 fathoms, the bottom is foul. There is also anchorage about 7 cables north-westward of San Cataldo lighthouse and the same distance from the shore, in 10 fathoms.

Vessels of less than 24 feet draught may enter the harbour, taking care to give the head of the breakwater a berth of half a cable in rounding it, and to keep within one cable's distance of the breakwater, as the bay shoals rapidly south-westward of that line.

Pilots will usually be found off the breakwater. Signals will be made from the semaphore station when it is dangerous for vessels to enter the port.

**Giovinazzo.**—Between Bari and Molfetta, 13 miles farther north-westward, the only conspicuous objects are the lighthouse on the rocky point of San Cataldo; the tower of the small port San Spirito; and Giovinazzo, a small dilapidated town on a steep cliff, north-westward of which is a creek frequented by coasting vessels; its church has two brownish steeples of unequal height. In fine weather a vessel may anchor at a moderate distance off Giovinazzo a little westward of the town.

Lat. 41° 11' N.  
Long. 16° 40' E.

**MOLFETTA.**—The town of Molfetta, of some commercial importance, is on the main coast line of railway, and contains about 30,000 inhabitants; it stands on the sea-shore and presents an imposing appearance.

Plan of Molfetta  
on chart, 199  
[790].  
Lat. 41° 13' N.  
Long. 16° 36' E.

The port, which is on the north and western sides of the town, is formed by a mole of most irregular form about 900 yards in length, with a general north-westerly direction from the shore.

The mole has been extended from the main light that formerly marked the extreme of the San Michele mole, and it has considerably increased the accommodation of the port, which now affords fair shelter from all but strong north-westerly winds. The outer portion of the port has depths of about 4 fathoms, reducing gradually to its head. About half a cable south-westward of the main light is the Secca di Domenico, a rocky ledge partly above water, lying parallel with and about a cable from the shore; before the present breakwater existed the only shelter was between this shoal and the town, only available for very small craft.

**LIGHTS.**—A *fixed and flashing* light with a period of *three minutes*, visible in clear weather from a distance of 14 miles, is exhibited at an elevation of 66 feet above the sea, from an octagonal white lighthouse on circular base 60 feet in height, on the western angle of the breakwater about 3 cables within the extreme, showing thus:—*Fixed white, two minutes and eight seconds; eclipse, twenty-three seconds; red flash, six seconds; eclipse, twenty-three seconds.* The light is visible seaward when bearing from N. 63° W., through west and south, to S. 47° E.

A *fixed green* light, elevated 27 feet above the sea, is exhibited from the extremity of the breakwater, visible from a distance of 4 miles, but it cannot be lighted in bad weather.

Chart, 199 [790].  
Var. 7° 45' W.

A *fixed red* light, elevated 58 feet above the sea, is shown near the harbour master's office, at the head of the port, visible at a distance of 5 miles; the light is obscured when bearing southward of S. 27° E.

Plan of Bisceglie  
on chart, 199  
[790].  
Lat. 41° 15' N.  
Long. 16° 30' E.

**BISCEGLIE.**—This port,  $4\frac{1}{2}$  miles north-westward of Molfetta, is little more than a cable in extent; it is open to the northward, but is sheltered from easterly and from westerly winds, has a depth of 2 fathoms at the entrance, and from 6 to 10 feet in the middle. It is formed by an indentation of the shore on the west, and by a mole extending about a cable in a N.N.W. direction on the east; the entrance is about 120 yards wide. The small craft which frequent the port moor to the quays or alongside the mole, or to a bollard on the rock near the centre of the port, southward of which there is scarcely a depth of 3 feet.

The town of Bisceglie is close to the shore; it contains about 25,000 inhabitants, trades in oil and fruits, and has one or two small establishments for building and repairing coasting vessels. It is entirely destitute of springs, and rain water only is procurable.

Plan of Trani on  
chart, 199 [790].  
Lat. 41° 17' N.  
Long. 16° 25' E.

**TRANI** is a handsome town surrounded by lofty walls, protected by a castle, and has about 26,000 inhabitants. It may be recognised by a church on an eminence near the centre; also by the castle with three bastions at its western extreme.

The port is  $4\frac{1}{2}$  miles north-westward of Bisceglie; and, though once important, is now almost filled with sand, so that scarcely 10 feet water can be found at its entrance and only 5 feet in the middle. Its shape is circular; the entrance, less than 100 yards wide and open to the northward, is between two piers. It is only capable of admitting vessels of very light draught which may moor under shelter of the eastern pier.

In fine weather and with an off-shore wind, vessels anchor off the coast at about a mile from the port in a depth of 7 to 9 fathoms sandy bottom.

**Gunnery practice ground.**—On the Marina di Trani there is a practising ground for gunnery which extends  $1\frac{1}{2}$  miles west of the Castello di Trani and nearly a mile off shore. During practice the limits of danger are indicated by two red flags with black balls over, the eastern signal is made on the Cascina Arisciano, and the western  $1\frac{1}{2}$  miles west of the Castello di Trani, where the practice is being carried out.

**Light.**—From a circular turret on Trani East pier, at an elevation of 31 feet above the sea, is exhibited a *fixed red* light, visible in clear weather from a distance of 4 miles; it cannot be lighted in bad weather.

**BARLETTA** is  $6\frac{1}{2}$  miles north-westward of Trani, and the coast between is low, sandy, and uninhabited; boats may haul up on it. The town of Barletta was once splendid and populous, but now presents an indifferent aspect, though from the great harbour improvements in progress and approaching completion, it is possible that its ancient prosperity may revive. The streets are well paved, the houses large and lofty, the cathedral remarkable for its antique granite columns, and the citadel is spacious and commands the port.

A considerable trade is carried on in salt, prepared near the town in salinas, which render the atmosphere very unwholesome.

The population on December 31st, 1901, amounted to 42,345.

As with other towns on this seaboard, Barletta is on the Adriatic coast line railway, but from Barletta the line passes inland through Foggia, and avoiding the high lands of Gargano, approaches the coast again just westward of lake Lesina. Barletta also communicates with Bari by tramway.

Plan of Barletta  
on chart, 199  
[790].  
Lat. 41° 20' N.  
Long. 16° 17' E.

**Harbour.**—The harbour is north-eastward of the town, and is formed on its western side by a mole of very irregular form which projects from the shore for 400 yards in a N. by W. direction, then continues 273 yards in an easterly direction, N.E.  $\frac{3}{4}$  N. 270 yards, and finally East 317 yards; the total length is about 1,260 yards.

Chart, 199 [790],  
with plan of  
Barletta.  
Lat.  $41^{\circ} 20' N.$   
Long.  $16^{\circ} 17' E.$   
Var.  $7^{\circ} 45' W.$

On its eastern side, a mole commencing about 350 yards eastward of the castle, projects in a N. by E.  $\frac{3}{4}$  E. direction about 700 yards, and thence continues with a slight curve inwards for about the same distance; from its extreme the light on the West mole head bears S.W.  $\frac{1}{2}$  W., distant  $2\frac{1}{2}$  cables.

**Depths.**—The space enclosed between these moles is about 130 acres in extent; of this, the inner part is very shallow, having less than 12 feet; it is being dredged to a depth of 18 feet.\* Vessels of 21 feet draught can enter the port and lie alongside the western mole. It is proposed to lay rails to connect the harbour direct with the railway.

**A light-buoy**, showing a *fixed red* light, about  $1\frac{1}{4}$  cables eastward of the West molehead, marks the area being dredged.

The steam dredger, if on the dredging ground at night, exhibits two *fixed red* lights.

**Communication.**—The Florio Rubattino and Puglia steamship lines, besides other vessels, maintain regular communication between this port and Venice, Sicily, and Genoa.

**Consulate.**—A British Vice-Consul is stationed at Barletta.

**Trade.**—The principal imports consist of wood, coals, spirits, and mineral oils; in 1906, valued at 158,165*l.* The exports are wine, brandy, olive oil, wheat and wine casks; valued at 127,630*l.*

The number of vessels entered during the same year amounted to 498 sailing and 228 steam, with a total tonnage of 148,446.

Coasting vessels are built at Barletta.

**Coal.**—About 20,000 tons are imported annually and 1,500 tons are usually kept in stock by private firms; 15 small lighters of 5 to 6 tons can supply 200 tons in the day. Depth alongside coal wharf 19 feet.

**Supplies.**—Provisions of all kinds can be obtained, but the water is bad. Vessels of war obtain the latter from the citadel, others from a cistern near the entrance, and there is a hose on the Harbour master's quay; price of water about 5*s.* per tun.

**LIGHTS.**—**West mole.**—A circular stone lighthouse 64 feet in height, stands on the middle inner angle of the West mole at Barletta; from it is exhibited a *fixed white* light at an elevation of 69 feet above the sea, visible in clear weather from a distance of 9 miles.

From a red iron support on the West mole-head, about 500 yards E.N.E. from the preceding, a *fixed green* light is exhibited at an elevation of 29 feet above the sea, visible from a distance of 5 miles.

**Breakwater.**—From a red iron support at the extreme of the East mole, at an elevation of 49 feet above the sea, is exhibited a *fixed red* light, visible from a distance of 10 miles, but it cannot be lighted in bad weather.

**At night**, in approaching from the eastward, the *white* light on the West mole must be kept southward of S.W.  $\frac{1}{2}$  W., and well open westward of the *green* light until the East mole-head light has been passed; then steer in with the *green* light on the starboard bow.

**Buoy.**—About  $2\frac{3}{4}$  miles north-east of the entrance to Barletta port, a buoy is moored where the hopper punts discharge.

\* In September 1904, an Italian government Notice stated that the depth in this harbour is generally less than that shown in the plan on Admiralty chart, No. 199; and that depths of from 5 to 10 feet only extend along the north side and head of the Harbour Office quay.

Chart, 199 [790].  
Lat.  $41^{\circ} 21' N$ .  
Long.  $16^{\circ} 17' E$ .  
Var.  $7^{\circ} 45' W$ .

**Barletta road** is superior to that of Bari. There is good anchorage north-westward of Barletta in depths of  $5\frac{1}{2}$  to  $6\frac{1}{2}$  fathoms, mud and gravel, at from 8 cables to  $1\frac{1}{2}$  miles from the lighthouse on the middle of the West mole, or farther out in 8 or 9 fathoms, sandy bottom. This anchorage is frequented during the fine season, but is very dangerous with on-shore winds.

At night, a vessel should anchor in 7 to 9 fathoms, with the *white* light well open westward of the *green* light bearing about S.W., distant between 2 and 3 miles.

In clear weather, vessels from the northward may recognise the position of Barletta by a high mountain, 14 miles S. by E. from the town, on the summit of which is a castle. Barletta is, moreover, the first town on the coast southward of Gargano head.

Lat.  $41^{\circ} 22' N$ .  
Long.  $16^{\circ} 14' E$ .

**COAST.—Ofanto river.**—The land in the immediate vicinity of Barletta is fertile, but beyond this commences the series of low beaches and marshy lands which border the gulf of Manfredonia. At  $3\frac{1}{2}$  miles north-westward of Barletta is the mouth of the Ofanto, the most easterly river of Italy. It rises in the Apennines near the town of St. Angelo de' Lombardi and disembogues at the boundary of Capitanata and Bari provinces, discharging a large amount of deposit. Fishing craft ascend this river when the bar at its mouth is least obstructed.

At 4 miles west-north-westward of the mouth of the Ofanto are the government salt marshes of Barletta; they are easily recognised by the large storehouses on the sea shore, off which, in fine weather, vessels may anchor at 2 miles from the land, in a depth of 7 or 8 fathoms, mud.

**Shoal.**—At  $3\frac{1}{2}$  miles north-westward of the Ofanto mouth, a 3-fathoms shoal (doubtful) is charted, which lies abreast the Barletta salt-marshes at about  $1\frac{1}{2}$  miles from the shore.

**Lake Salpi.**—From Barletta salt marshes to the town of Manfredonia, a distance of about 20 miles, the coast is low, sandy, and intersected by marshes, which render it unhealthy. The first is Lake Salpi, also called Salapina marsh, a sheet of water extending nearly  $6\frac{1}{2}$  miles north-westward from the salt marshes of Barletta, and only separated from the sea by a narrow strip of sand, about the centre of which stands the Pietre tower. The mouth of the Carapella river is 7 miles north-westward of the Pietre tower; its position is indicated by the tower of Rivolo, 7 or 8 cables south-eastward of the entrance.

The other lakes, fed by the waters of small streams flowing from the Apennines, and intersected by strips of land on which a few buildings may be seen, are not so large as Salpi. The most important are Salso lake, which communicates with the sea by the same mouth as the Candelaro river, and the marshes of Sipontum, which communicate with the sea by the St. Antonio canal, one mile southward of Manfredonia. On the hill opposite are the ruins of ancient *Sipontum*.

Plan of Manfredonia on chart, 199 [790].  
Lat.  $41^{\circ} 38' N$ .  
Long.  $15^{\circ} 56' E$ .

**MANFREDONIA.**—The town of Manfredonia, founded in 1250 by King Manfred, occupies a pleasant site at the head of the gulf of Manfredonia and at the foot of mount St. Angelo; it is surrounded by walls, and is protected on the north-eastern side by a strong castle. The town is in communication with the general railway system of Italy by means of a branch line to Foggia, and, owing to its position, is the centre of the trade of the province of Capitanata and the adjoining country; it contains about 10,500 inhabitants.

which, in fine weather, vessels may  
depth of 7 or 8 fathoms, mud.

off the Ofanto mouth, a 3-fathoms  
east the Barletta salt-marshes at

marshes to the town of Manfredonia  
is low, sandy, and intersected  
the first is Lake Salpi, also called  
nearly  $6\frac{1}{2}$  miles north-westward  
y separated from the sea by a  
which stands the Pietre tower.

north-westward of the Pietre  
of Rivolo, 7 or 8 cables south-

l streams flowing from the  
on which a few buildings may  
important are Salso lake,  
outh as the Candellaro river,  
icate with the sea by the  
Manfredonia. On the hill

Manfredonia, founded in 1250  
the head of the gulf of  
Rivolo; it is surrounded by  
by a strong castle. The  
system of Italy by means  
of Manfredonia, is the centre of the

No. 1367.—OZANTO RIVER APPROACH—Non-Existence of Shoal.  
Position on charts.—At a distance of  $8\frac{1}{2}$  miles north-westward from  
the Ozanto river entrance.  
Lat.  $41^{\circ} 23'$  N. long.  $16^{\circ} 10\frac{1}{2}'$  E.  
Description.—A 3-fathom shoal marked "D" on charts.  
Chart No. 1367.  
Med. 3. p. 54.

**Trade.**—Manfredonia has building yards, store houses, and a small hospital fitted for 20 patients. Marsh fever and ague are prevalent.

In 1893, 606 vessels of an aggregate tonnage of 12,208 tons entered the port. The exports are chiefly olive oil and dried fruits; the imports, coal, coffee, spirits, &c.

Chart, 199 [790],  
with plan of  
Manfredonia.  
Var. 7° 50' W.

**Harbour.**—Its small and open harbour is on the south-western side of a jetty which extends southward from an angle of the castle; the jetty extended 465 yards from the lighthouse at its inner end in 1904, and is being lengthened in order to prevent the sand, washed up by easterly winds, from filling up the harbour. The space close westward of the break-water has been dredged to a depth of about 15 feet. The harbour is quite open to strong southerly winds and is then very dangerous.

**Consulate.**—A British Vice-Consul is resident at Manfredonia.

**Supplies.**—Fresh provisions, vegetables, and fish may be procured; also water from a fountain.

**LIGHTS.**—At the inner end of the mole is an octagonal white lighthouse with two-storey dwelling, 60 feet in height, from which is exhibited at an elevation of 67 feet above the sea, a *fixed and flashing white light* with a period of *one minute*, visible in clear weather from a distance of 14 miles, and showing thus:—*Fixed, forty-seven seconds; eclipse, four and a half seconds; flash, four seconds; eclipse, four and a half seconds.*

At the extremity of the mole, and moved outwards as the work of extension progresses, a *fixed red electric light*, is shown from an iron mast and shed, at an elevation of 34 feet above the sea, visible, in clear weather, from a distance of 4 miles.

On the approach of the mail steamer at night, a *red light* is shown from the southern part of the town wall.

**Manfredonia road**, at the head of the gulf of Manfredonia, affords the best anchorage on the eastern Italian coast, especially in a heavy Bora gale. Vessels ride safely about 2 miles from the shore, in a depth of 6 to 7 fathoms, mud, with the town bearing N.W. by N., and mount St. Angelo about N. by E., or farther out in deeper water if desired.

Lat. 41° 36' N.  
Long. 15° 58' E.  
Chart, 199 [790].

During summer, small vessels may anchor in 5 fathoms, mud, a long half mile south-eastward of the mole head.

When at anchor at the head of the gulf of Manfredonia, the Bora wind called *Monterese* by the inhabitants, rushes down in violent squalls from the gorges of mount Gargano peninsula.

Manfredonia road is exposed to winds from between S.S.E. and N.E., but, however violent in the offing, the wind seldom blows hard near the land, and the sea is never very heavy at the anchorage. A south-westerly wind sometimes blows in heavy squalls, but not for any length of time; it blows lightly almost every night, veers to the westward at daybreak, and remains in that quarter during the greater part of the forenoon.

**Directions.**—Mount Gargano peninsula is lofty, with many isolated peaks, and is a useful guide to the anchorage in Manfredonia road from whatever quarter it is approached. It is the first high land seen on the coast of Italy in coming from the Mediterranean; mount Calvo, its highest peak, is 3,465 feet above the level of the sea, and mount St. Angelo, 2,900 feet; near the summit of the latter is the town of that name; it has a tower with a semaphore, and also a church.

In running from the north-westward for the anchorage in Manfredonia road, during a Bora, the coast of Gargano head should be rounded at a

Chart, 199 [790].  
Var. 7° 50' W.

short but prudent distance, taking care to be prepared for violent gusts from the high land.

In summer, if the wind is north-westerly outside, it will generally be found about E.N.E. after passing the head; in winter, on the contrary, it hauls to the westward and comes down in violent squalls from the high land of Gargano. In such a case, a sailing vessel may have to tack; the land should be kept close aboard until nearing Manfredonia, when it should have a wider berth, and especially southward of that place, where the water shoals off some distance; nearly 3 miles north-eastward of the tower of Rivolo the depth is only  $5\frac{1}{2}$  fathoms.

Lat. 41° 42' N.  
Long. 16° 6' E.

**Mattinata.**—The best anchorage for a vessel not wishing to stand far into the gulf, is off Mattinata, eastward of Rossa point and distant 2 miles from the point, in a depth of 6 or  $6\frac{1}{2}$  fathoms, mud. This anchorage is 9 miles south-westward of the eastern extreme of Gargano head, and, in addition to the lighthouse and semaphore on Rossa point and the telegraph station on the hill about 660 feet above it, a tower on the shore three-quarters of a mile to the northward will be seen, and also the town of Mattinata inland, in the midst of cultivated land.

There is also anchorage off any part of the coast between Mattinata and Manfredonia in the same depth of water, at no greater distance from the land. Should the force of the wind compel a vessel to bring up farther off, the anchor should be dropped within three miles of the land and southward of Mattinata, where about the same depth of water, mud bottom and good holding ground, will be found; this anchorage is often used by vessels of war.

Nearly midway between Manfredonia and Rossa point, and extending a long half mile from the shore, there is a shoal patch of  $2\frac{3}{4}$  fathoms.

**LIGHT.**—The lighthouse on Rossa or Monte-grugno point, near Mattinata, was destroyed by earthquake, 10th August, 1893. A *fixed white* light is exhibited, at an elevation of 51 feet above the sea, from a tower with square base and dwelling, 21 feet high, on Punta Agnuli,  $1\frac{1}{4}$  miles north-east of Rossa point. The light is visible in clear weather from a distance of 11 miles, between the bearings of N. 47° E., through north and west, to S. 81° W.

**Semaphore.**—There is a semaphore station on Rossa point.

Lat. 41° 49' N.  
Long. 16° 12' E.

**GARGANO HEAD.**—Between Manfredonia and Gargano head the coast is everywhere high and mostly inaccessible. The eastern part of mount Gargano peninsula presents a face about 11 miles in breadth. The coast is high and perpendicular towards the sea, and may be approached to within a mile or more according to wind and weather; the head is the most easterly projection, high, and steep towards the sea. Southward of the head are the Campi and other towers, and northward of the former is the little islet of Campi; farther northward, between the head and Vieste, are the towers of Felice and Gattarella, and the islet of Portonuovo surrounded by rocks.

Southward of Vieste is a low and open beach off which vessels may anchor temporarily in depths of from  $5\frac{1}{2}$  to  $6\frac{1}{2}$  fathoms, hard mud. This anchorage, which is sheltered from westerly winds, may be used by vessels seeking shelter from that quarter, but the anchor should be weighed immediately the wind begins to abate.

**PORT VIESTE,** nearly 4 miles northward of Gargano head, is situated between two projecting points; Sta. Croce islet, 165 yards off the northern point, protects it in some measure from the north-eastward, and

Plan of port  
Vieste on chart,  
199 [790].  
Lat. 41° 53' N.  
Long. 16° 11' E.

thus forms a small natural harbour, which has generally from 8 to 12 feet water; near the islet, however, which is surrounded by a bank, the depth is from 20 to 23 feet. The depth increases seaward both north-westward and south-eastward of Vieste, and here vessels may anchor with off-shore winds.

Chart, 190 [790],  
with plan of port  
Vieste.  
Var. 7° 50' W.

The port is open to the eastward and the current runs with considerable strength at times. Coasting vessels make fast to Sta. Croce islet, westward of which there are two mooring buoys.

**Town.**—The small town of Vieste stands on a rocky point on the southern side of the harbour, close to the sea, and at the foot of mount Gargano. It is built in the shape of an amphitheatre and may be recognised by its isolated position, by a fort on which is the semaphore, by a steeple which overlooks the town, and, on the north, by Sta. Croce lighthouse. The borgo or suburb stands on the shore between the two points of the bay. Small supplies may be obtained.

**LIGHT.**—On Sta. Croce islet is an octagonal white lighthouse, 90 feet high, above a two-storey dwelling, from which, at an elevation of 132 feet above the sea, is exhibited a *fixed white* light visible in clear weather from a distance of 18 miles between the bearing N. 9° E., through west and south, to S. 48° E.

**Semaphore.**—Vieste semaphore, situated on the fort, is connected with the telegraph system; *see* page 9.

**Wireless telegraph.**—There is a wireless telegraph station at Vieste; *see* page 36.

**THE COAST,** from port Vieste, trends round north-westward 9 miles to the village of Peschici, and, although there are sandy beaches, it is generally difficult of access even to fishing-boats. The most conspicuous objects are the Monticello, Porticello, and Spinale towers, and the projecting point and tower of Calalunga. The land may be approached to the distance of a mile, bearing in mind that the current sets towards it.

Chart 199 [790].

**Peschici** is a small village on a picturesque height perpendicular towards the sea. There is indifferent anchorage for coasters westward of the village in a depth of 2½ or 3 fathoms, mud.

Lat. 41° 57' N.  
Long. 16° 1' E.

**Rodi.**—At 6 miles westward of Peschici is the town of Rodi, on an advanced and precipitous hill; it occupies a beautiful position amidst gardens and olive trees. A pier which formerly protected the small harbour of Rodi against northerly winds was destroyed by the sea. Coasting vessels generally anchor a quarter of a mile off shore, but the anchorage is not good. The town may be recognised by Ischitella church steeple on an eminence above it.

**Supplies.**—Provisions and water may be obtained. A large trade is carried on in oranges, lemons, almonds, &c.; timber for shipbuilding is procured from the forests of Gargano.

**Anchorage.**—Between Peschici and Rodi, the 5-fathoms contour-line is a mile off shore in places. Vessels of deep draught may anchor between Peschici and Rodi, at 1½ miles or more from the shore, in a depth of about 10 fathoms, sheltered from a south-easterly gale and from all off-shore winds. This anchorage may be useful to a vessel bound out of the Adriatic, overtaken by a strong south-easterly wind and unable to round Gargano head, but it should be abandoned at the slightest symptoms of a northerly breeze.

Chart, 199 [790].  
with plan of  
Tremiti islands.  
Lat.  $42^{\circ} 6' N$ .  
Long.  $15^{\circ} 29' E$ .  
Var.  $8^{\circ} W$ .

**The TREMITI ISLANDS**, so called from the frequency of earthquakes in former times, lie 20 miles north-westward of Rodi, are four in number, almost uncultivated, and produce nothing but a little oil and firewood. They are low by comparison with the high land of the main, the highest point being a hill elevated 377 feet above the sea. Their shores, especially on the northern side, are generally steep and inaccessible; they cover an extent of nearly 3 miles north-east and south-west by a width of about 7 cables, and the soundings close round them are deep, varying from 17 to 35 fathoms. The only water is in the well of the fort at the south-western end of San Nicola island. They are in telegraphic communication with the mainland by means of a submarine cable between San Nicola and Mileto point. *See* view on chart.

San Domino, the largest and south-western island of the group, is  $1\frac{1}{2}$  miles in length and two-thirds of a mile in breadth. It is the highest of the group, the hill before mentioned rising at its south-western part.

Cretaccio, the smallest islet, is about 2 cables in length and lies three-quarters of a cable from the north-eastern end of San Domino; at its eastern end is La Vecchia, a large rock awash. There is no passage between San Domino and Cretaccio, nor between the latter and La Vecchia.

San Nicola the south-eastern island, is steep, rocky, and  $8\frac{1}{2}$  cables in length; at its south-western end is a large building formerly a convent, a fort, the semaphore, a small pier for boats, and the landing place.

The passage between San Nicola and La Vecchia is fit only for vessels of light draught, as not more than 15 feet water can be carried through; a depth of 6 feet was reported to exist (1907) near the middle of the passage, and local knowledge therefore appears to be necessary for vessels using it.

Caprara, the north-eastern island, is steep on its northern side, gradually slopes to the southward, and is separated from San Nicola by a passage about  $1\frac{1}{2}$  cables wide; vessels using this passage should keep in mid-channel.

**Telegraph cable.**—The submarine cable connecting the Tremiti islands with the mainland at Mileto point, leaves the south-eastern coast of San Nicola immediately below the semaphore. Its direction on leaving the shore, is about S.  $\frac{1}{2}$  W., and is marked by two beacons.

**Semaphore.**—There is a semaphore station on the fort at San Nicola island; *see* page 9.

**Anchorage.**—The anchorage at the Tremiti islands gives sufficient shelter from a Bora gale, and is also convenient for vessels desiring to reach Manfredonia road, but unable to round Gargano head.

A vessel of deep draught should anchor off the south-eastern coast of San Domino, about 3 cables from the shore, in depths of from 17 to 35 fathoms, mud bottom, and good holding ground. The nearer a vessel approaches the south-western end of San Nicola, the better the shelter from a Bora.

Small vessels anchor sufficiently near San Nicola, to make fast to some strong posts under the fort; or, between San Nicola fort and San Domino, securing to posts on Cretaccio; they also anchor between Cretaccio and San Domino, and run a hawser out to each island. The last anchorage is preferred, as it affords the best security against a Bora.

Vessels should avoid anchoring in the vicinity of the telegraph cable, which leave the shore of San Nicola below the semaphore, as described above.

The anchorage northward of San Nicola is more exposed and not so convenient for getting under way; vessels have also to avoid a rocky patch of  $4\frac{1}{2}$  fathoms lying nearly one cable from the south-western point of Caprara island, and also a rocky bank, covered with only 4 feet water, about the same distance north-eastward of Cretaccio.

Coasters sometimes seek shelter from south-easterly gales in Turchi cove, a small creek on the north-western side of Caprara island.

**LIGHTS.**—**Caprara island.**—Near the north-eastern end of Caprara island is a white octagonal tower 51 feet high, above a yellow dwelling, from which is exhibited, at an elevation of 118 feet above the sea, a *fixed white* light, visible in clear weather from a distance of 14 miles, when bearing between N.  $17^\circ$  E., through west and south, and S.  $56^\circ$  E.; and also through a small sector of  $3\frac{1}{2}^\circ$  over the channel and anchorage between St. Nicola, Cretaccio, and San Domino.

**Diavolo point.**—Near Diavolo point, at the south-west end of San Domino island, from an octagonal turret on a large white house, and at an elevation of 159 feet above the sea, an *occulting white* light with a period of *thirty seconds*, is exhibited, showing thus:—Light, *twenty seconds*; eclipse, *ten seconds*. The light is visible in clear weather from a distance of 9 miles, from the bearing of N.  $80^\circ$  W., through north and east, to S.  $31^\circ$  E.

**San Nicola isle.**—From an octagonal structure, 14 feet high, on the south-west side of San Nicola castle, at an elevation of 43 feet above the sea, is exhibited a small *fixed white* light, visible in clear weather from a distance of 6 miles.

**Directions.**—As there is no good harbour between Ancona and Manfredonia, and sailing vessels are often driven to leeward by Bora gales, which at times blow for 4 or 5 days, more or less, and with great violence, the anchorage at the Tremiti islands is in such cases recommended; here shelter is afforded with the wind from about N.E., through north, to W. by S. With the wind from the northward, a vessel should pass eastward of the islands, and along the southern side of San Nicola as near as convenient, for the anchorage at its south-western end; there is more than 30 fathoms water close-to.

**PIANOSA ISLE**, 50 feet in height, situated E. by N.  $\frac{3}{4}$  N., distant  $1\frac{1}{2}$  miles from the north-eastern extreme of the Tremiti islands, is a low flat arid rock, depressed towards the south but rising a little on its north side. It is nearly 4 cables in length, and about  $1\frac{1}{2}$  cables in breadth; the northern side is steep-to at the distance of half a cable; and the southern side is foul more than 2 cables off. The currents in its locality are at times strong and uncertain in direction, and it should, therefore, be given a berth in a sailing vessel.

**PELAGOSA ISLES**, two in number, Grande and Piccola, are nearly in the middle of the Adriatic, about 25 miles E. by N.  $\frac{3}{4}$  N. from Pianosa islet.

Pelagosa Grande is an uncultivated rock rising perpendicularly towards the south, but less steep on its north side; it is  $7\frac{1}{2}$  cables long east and west and  $1\frac{1}{2}$  cables wide, with its highest part 343 feet above the sea, towards the west. The Manzi rock, 8 feet high, and other rocks level with the water, with the Pampano rock at their extreme, extend  $1\frac{3}{4}$  cables from its western point. At the north-western end of the islet, is a small cove where fishermen haul up their boats in bad weather.

Chart, 199 [790].  
with plan of  
Tremi islands.  
Lat.  $42^\circ 6' N$ .  
Long.  $15^\circ 29' E$ .  
Var.  $8^\circ W$ .

Plan of Pianosa  
on chart, 199  
[790].  
Lat.  $42^\circ 13' N$ .  
Long.  $15^\circ 45' E$ .

Plan of Pelagosa  
on chart, 199  
[790].

Chart, 199 [790]  
with plan of  
Pelagosa.  
Var. 8' W.

Pelagosa Piccola, 127 feet high and  $2\frac{1}{2}$  cables in length, is off the eastern end of the larger islet and is surrounded by other rocks and islets to the distance of more than a cable.

The position of Pelagosa Grande in the middle of the Adriatic, and about midway between Gargano head and Lagosta island, renders it a good point of departure for vessels navigating the Adriatic during the fine season. They should, however, always avoid approaching it closely, especially at night or in thick weather, on account of the currents, which are very irregular in its vicinity.

Lat.  $42^{\circ} 23' N.$   
Long.  $16^{\circ} 15' E.$

**LIGHT.**—On the highest part of Pelagosa Grande is a tower above a two-storey dwelling, 74 feet high, from which is exhibited, at an elevation of 359 feet above the sea, a *fixed and flashing white* light, with a period of *half a minute*, thus:—Fixed, *twenty-four seconds*; flash, *six seconds*. The light is visible in clear weather from a distance of 26 miles.

**Wireless telegraph.**—It is proposed to establish a wireless telegraph station at Pelagosa Grande island.

Chart, 199 [790].

**CAJOLA ROCK** lies E. by S.  $\frac{3}{4}$  S. distant 3 miles from Pelagosa Piccola; it is about 17 feet high and barely a cable in length. At 3 cables eastward of Cajola rock is the Pampano, a narrow rocky ledge about two-thirds of a mile in length, the centre of which breaks. On account of the current, it is imprudent for a sailing vessel to pass between Pelagosa and Cajola rock, although the channel is wide and deep.

**COAST.**—Westward of Rodi commences a long uniform sandy beach, which extends almost uninterruptedly for about 150 miles, as far as mount Conero, near Ancona. From Rodi to the mouth of the Tronto river, a distance of nearly 120 miles following the coast line, although the coast is not very populous and is mostly only cultivated in the vicinity of towns, provisions may be obtained in abundance, especially fresh water, which is everywhere supplied by numerous torrents descending from the Apennines; but there is not a single harbour wherein a vessel may obtain shelter. The water shoals for 3 or 4 cables from the shore, over a bottom of sand or gravel; farther off, the bottom is mud, or mud and sand.

In fine weather, the whole of this portion of the Italian coast may be ranged along at the distance of a long mile in depths of from 6 to 10 fathoms; attention being paid to the lead. With off-shore winds, or, in fine weather, even with south-easterly winds, vessels may anchor in the offing, at the distance of 2 miles from the shore, in good holding ground.

**Anchorage.**—The following is a brief description of the principal anchoring places for coasters:—

Lat.  $41^{\circ} 55' N.$   
Long.  $15^{\circ} 37' E.$

**Mileto point.**—Nearly 10 miles westward of Rodi is Capojale point, the termination of a long sandy shore named Varano wood, and 2 miles westward of it is Mileto point and tower. The coast between these two points and for a mile westward is rocky, rather high, and precipitous. Mileto point is remarkable for its projection northward between two long sandy beaches, and as terminating a chain of heights separating the two great lakes of Varano on the east, and Lesina on the west.

**Telegraph cable.**—The submarine cable communicating with San Nicola, Tremiti isles, leaves the shore at Mileto point, south-eastward of the semaphore in a bay below the Trappeto del Principe. A beacon

with a notice board, 10 feet from the sea, marks the spot where the cable is landed. From thence, it is laid N.  $\frac{1}{2}$  E. for 340 yards, and then N. by W.  $\frac{1}{4}$  W. Chart. 199 [790].  
Var. 8° 10' W.

**Varano and Lesina lakes.**—These lakes, which are only separated from the sea by low narrow strips of sand, overgrown by forests of beech and oak trees, communicate with it by two small channels inaccessible even to fishing boats. The only trade carried on in the neighbouring villages and in the town of Lesina, near the south-western extreme of the lake of this name, is in fish, with which the lakes abound.

**Railway.**—The Adriatic coast line railway, which quits the neighbourhood of the shore westward of Barletta and passes westward of all the high land of Gargano, again approaches the coast near the western end of Lesina lake, crossing the Fortore river about  $1\frac{1}{2}$  miles inland, and from thence, keeps close to the coast the whole of the distance to Rimini.

**Fortore river** (ancient *Frento* or *Frentone*), rises in the woods of Mazzocco, at mount Chilone, and its mouth, which is  $15\frac{1}{2}$  miles westward of Mileto point and  $2\frac{3}{4}$  miles beyond Pietre Nere point, may be recognised by a large tower-shaped storehouse on the beach. Small craft, drawing about 4 feet, can ascend the river when the changing positions of the shallow banks at its mouth leave the pass free. Lat. 41° 55' N.  
Long. 15° 17' E.

**Anchorage.**—Vessels anchor  $1\frac{1}{2}$  miles from the shore, northward of the mouth of the Fortore, in a depth of about 11 fathoms, sandy bottom, with the storehouse at the mouth of the river bearing S. by W. This, however, is a bad anchorage with north-easterly and northerly winds, as they raise a heavy sea and accelerate the currents; but it affords tolerable anchorage with easterly and south-easterly winds, an advantage not possessed by any of the anchorages to the westward as far as Ancona. The position is known by the storehouse, in which the produce of the interior, especially the corn destined for exportation, is deposited. Coasters obliged to remain any length of time at this anchorage moor their vessels securely, the crews going on shore at sunset to avoid being wrecked in them, in the event of a heavy Bora.

**Campomarino.**—From the mouth of the Fortore, the coast is low, and almost entirely covered with the woods of Sta. Agata Maresca, and Ramitello; the shore all along is a sandy beach, the only remarkable objects being the towers of Mozza and Saccione, the latter near the mouth of a small river of the same name, and then the tower and village of Campomarino, standing on an elevation near the shore and surrounded by a fertile plain. Campomarino is near the right bank at the mouth of the river Biferno, and is on the coast line railway. The river Biferno has its source at the foot of the mountains of that name near Boiano, and flows into the sea through marshes and low sandy land; fishing boats are able to ascend it when the waters are swollen. Lat. 41° 58' N.  
Long. 15° 2' E.

**Anchorage.**—Vessels may anchor off Mozza tower in a depth of 9 or 10 fathoms, north-eastward of a mountain inland which will be seen between mounts Lesina and Termoli. There is also an anchorage off Campomarino, in 8 to 6 fathoms, at a fair distance from the shore; small craft can ascend the river Biferno, under the same conditions as at Fortore. At about  $5\frac{1}{2}$  miles S.S.W. of Termoli, is the town of San Martino, standing on a hill 912 feet above the sea.

**Termoli.**—This town stands on a projecting rocky point  $3\frac{1}{4}$  miles north-westward of Campomarino; it is on the coast line railway, is small,

Chart. 199 [790].  
 Lat. 42° 1' N.  
 Long. 14° 59' E.  
 Var. 8° 20' W.

fortified, and contains about 2,000 inhabitants. Small supplies and water may be obtained.

**Anchorage.**—Vessels anchor off Termoli at about  $1\frac{1}{2}$  or 2 miles northward or north-eastward of the town, in depths of from 9 to 12 fathoms, mud. This anchorage is, however, very inconvenient with easterly and northerly winds, and sailing vessels should stand off the land if the wind comes from these quarters.

**Coast.**—The coast from Termoli bends round north-westward and northward for 18 miles to Penna point, and is a wooded desert, with the exception of the town of Vasto, standing at the turn of the bend; but, being low and bordered by a sandy beach as far as Vasto, coasting boats are enabled to approach it and haul on shore in case of need. The interior of the country is high and mountainous. Numerous rivers and torrents discharge their water into the sea between Termoli and Vasto, and some rocks lie here and there near the shore between Vasto and Penna point. The Trigno, the position of which is shown by Montebello tower on its right bank, is the only important river, being navigable for small craft when the banks at its mouth admit of their crossing the bar.

**Anchorage.**—The anchorage off Petacciata is 8 miles south-eastward of Vasto, in a depth of 6 and 7 fathoms, good holding ground. This is a tolerable anchorage with an on-shore wind, the sea being broken before reaching it; when running for this anchorage, a vessel should steer for the land between Termoli and Penna point, towards a large wood, anchoring about a mile or a mile and a half from the shore.

Lat. 42° 7' N.  
 Long. 14° 43' E.

**VASTO.**—This town is on high land at the bend of the coast between Termoli and Penna point; it is on the coast line railway, is fortified, and has a population of about 14,000. The neighbourhood is well cultivated. Water and provisions are in abundance.

**Anchorage.**—Vessels anchor in depths of from 7 to 9 fathoms, mud bottom and good holding ground, about 3 miles north-eastward of the town; they generally moor with open hawse to the eastward, and by backing their anchors, are able to hold on with a strong breeze from East or E.N.E., if unable to get underway. Small coasters anchor nearer the town, about a mile from the shore.

**Penna point.**—The coast between Vasto and Penna point is rocky, high, and inaccessible, on account of the rocks by which it is bordered. The point itself is composed of dark rocks and is easily known by its projection to the north-eastward; also by a church, by a semaphore tower on its highest part, and by a large building a little inland.

**Sangro river.**—From Penna point to the mouth of the Sangro river the shore is sandy, and, with the exception of the Aderico rocks near the tower a mile westward of the point, is everywhere accessible. Amongst the numerous streams which reach the sea on this coast the Sangro is the only one of any importance. It takes its rise in the mountains near lake Celano, and falls into the sea at Turino wood,  $8\frac{1}{2}$  miles north-westward of Penna point; a tower on the right bank marks its mouth. It is navigable for small craft when the entrance is open, and the railway crosses the river near its mouth.

North-westward of the Sangro, as far as the tower at the mouth of the Feltrino river and the small village of St. Vito, the coast is everywhere bordered by rocks; but between the latter and Ortona, where two rivers

rising at the foot of mount Majella reach the sea, it becomes low and accessible. St. Vito stands rather high, almost at the margin of the sea between two well-cultivated hills.

Charts,  
199 [790],  
200 [792].  
Var. 8° 20' W.

**ORTONA.**—The town of Ortona is about  $17\frac{1}{2}$  miles north-westward of Penna point; its position may be easily recognised from the sea by mount Majella, whose summit is 9,159 feet above the sea, an enormous round mass 22 miles south-westward of the town; the church steeple of Chieti and the various buildings of Ortona will be seen on nearing the coast. The town is on the main coast of railway line, is surrounded by walls, and contains many large buildings; its population, chiefly fishermen, is about 12,000. The environs are well cultivated. Provisions and cistern water are easily obtained.

Chart, 200 [792],  
with plan of  
Ortona.  
Lat. 42° 21' N.  
Long. 14° 25' E.

**Harbour.**—From the point on which the town stands, a projection surrounded by rocks extends north-eastward about the distance of a cable; the small harbour of Ortona is formed and the anchorage sheltered from northerly winds by a breakwater extending about 260 yards S.E. by S. from this rocky projection. Works are in progress for prolonging the old breakwater a further 380 yards in a S.E. by E.  $\frac{1}{2}$  E. direction; of this distance 164 yards were completed in December 1906.

The greatest depth of water under shelter of the breakwater, at present, is only from 6 to 12 feet sandy bottom; the harbour is therefore only available to small craft. There is a mooring buoy a short cable southward of the end of the old part of the breakwater.

There is indifferent anchorage a mile from the land, eastward of the town.

**LIGHTS.**—At 27 yards within the extreme of the breakwater at Ortona is exhibited, from a white pillar 29 feet high, at an elevation of 36 feet above the sea, a *fixed green* light, visible in clear weather, from a distance of 6 miles.

A *fixed red electric* light, elevated 13 feet above the sea, marks the extremity of the works in progress.

**Caution.**—Vessels must pass at least half a cable from the *red* light, as the works in progress extend some distance beyond it.

**COAST.**—**Francavilla.**—At about 6 miles north-westward of Ortona is Francavilla, a somewhat remarkable village containing about 2,600 inhabitants; it is near the margin of the sea on a small eminence surrounded by well cultivated lands. The shore between the towns is low and sandy, the only remarkable objects being the tower of Mucchia, and those at the mouths of the Ariello and Foro rivers.

Chart, 200 [792].

**PESCARA RIVER,** which separates the two Abruzzi, has its source in the mountains which surround the town of Aquilla, winds round the Gran Sasso d'Italia, passes Chieti, and falls into the sea, after flowing through the town of Pescara. It divides the town into two parts and is much frequented by coasters, which carry on the trade of the Abruzzi provinces; it is the safest little harbour on the coast, has a depth of  $6\frac{1}{2}$  feet, and can accommodate about 30 small vessels, which make fast to posts on the banks.

Lat. 42° 28' N.  
Long. 14° 14' E.

The town of Pescara is 4 miles from Francavilla and stands in a plain; it contains a population of about 2,000, is fortified, and is on the Adriatic coast line railway. Boats are built for the coasting trade. Small supplies can be obtained, but the water is bad.

Chart 200 [792].  
Var. 8 30' W.

**Anchorage.**—There is anchorage about  $1\frac{1}{2}$  miles off the mouth of the Pescara river, in a depth of 6 to 8 fathoms, mud bottom, and good holding ground, with the tower at the mouth of the river bearing W.S.W., or a mile farther out in 9 or 10 fathoms.

Lat.  $42^{\circ} 28' N.$   
Long.  $13^{\circ} 34' E.$

**LANDMARK.**—**Gran Sasso d'Italia (Mount Corno).**—The position of Pescara or any other place on the whole of this part of the coast may be easily known by a bearing of this mountain, whose summit lies W.  $\frac{7}{8}$  N. distant 29 miles from the entrance of the Pescara river; it is the most elevated mountain in the neighbourhood, being 9,560 feet high, and may be distinguished from others by its summit being divided into two pyramidal peaks of similar shape. The range on which it is situated extends some 10 miles eastward of it.

When bound to Pescara from the north-eastward, vessels should steer in for the land midway between mounts Majella and Corno until the fortress of Pescara is seen, which is low and visible only at a short distance.

**Coast.**—From Pescara river, westward of which is a large pine forest, to the Tronto river, 29 miles to the northward, the coast is low, sandy, and thinly inhabited, owing to the unhealthiness of its marshes. The most remarkable objects are, the village and castle of Silvi, on an eminence 8 miles from Pescara; Cerrano tower; the steeple of Atri church, 1,627 feet above the sea and about  $4\frac{1}{2}$  miles inland; the town of Mutignano, 2 miles from the coast and 1,100 feet above the sea; Montepagano; the village of Giulianova, on an eminence one mile northward of the mouth of the Tordino river; and the town of Tortoreto, on a hill between Giulianova and the Tronto.

This coast is intersected by many small streams and by seven rivers: the Salino, the Cerrano, the Calvano, the Vomano, the Tordino, the Salinello, and the Casone. These are of but little importance, and with the exception of the Salino and the Vomano, which fishing boats occasionally ascend, they all become dry in summer; each gives rise to an accumulation of deposit at its mouth.

**Anchorage.**—In fine weather sailing vessels may anchor at  $1\frac{1}{2}$  miles from any part of this coast, in a depth of 6 or 7 fathoms, mud, and may safely range along it at from that distance to  $2\frac{1}{2}$  miles, unless the wind blows right on-shore.

Boats engaged in the coasting trade anchor abreast of Silvi and Giulianova, beaching their boats in case of need, except near Cerrano tower, in front of which it is said to be rocky.

Lat.  $42^{\circ} 54' N.$   
Long.  $13^{\circ} 56' E.$

**TRONTO RIVER** rises at the foot of the Sibillini mountains, flows past Ascoli, and falls into the sea between two towers at its mouth. There is a depth of about 3 feet at its entrance at high water, at which time small coasters ascend it for about half a mile, passing with difficulty between the banks by which it is obstructed. The town of Colonella stands on a hill 1,095 feet high, 3 miles south-westward from the mouth of the Tronto, and is a good mark for its position.

General chart, 1,440 [789].

## CHAPTER III.

## TRONTO RIVER TO PORT BUSO.

**COAST.—General remarks.**—From the river Tronto to the mouth of the Po di Goro, the distance following the coast line, is about 144 miles. Between the Tronto and mount Conero, near Ancona, the coast is generally low and sandy; hills occur at long intervals, in continuation of the Apennines, but do not reach within half a mile of the shore except between Marano and S. Giorgio, the port of Fermo, where the shore is steep. These hills form a pleasing contrast with the beach, being well cultivated and dotted with towns and villages.

Charts, 200 [792],  
201 [793].  
Lat. 42° 53' N.  
Long. 13° 55' E.  
to  
Lat. 44° 49' N.  
Long. 12° 27' E.

At Rimini, the coast suddenly becomes uniformly low and sandy, and so continues to Maestra point, and beyond it throughout the whole of the gulf of Venice and part of the gulf of Trieste for 11 or 12 miles beyond the Austrian frontier at Port Buso. Between Rimini and Cervia, towns and villages are visible in the midst of a large cultivated plain; but, beyond the latter town, the coast is intersected by marshes; and, inland, is the largest pine forest of Italy, extending from Ravenna to Primara.

The rivers and numerous streams which run into the sea north-westward of Ancona, bring down a great quantity of soil, causing a gradual extension of the land seaward. The banks thus formed vary so often in shape and extend so far off that it is not prudent for vessels to approach the shore in bad weather. Where the land is high, rocks here and there border the shore and render it difficult of access, even to boats.

**Anchorage. — General remarks.** — These anchorages are described in detail in the following pages.

Small vessels may anchor anywhere between the river Tronto and Cesenatico, half a mile off-shore, especially in front of the towns and villages; and, between Cesenatico and the southern mouth of the Po di Tolle, about 35 miles northward of it, at 1½ miles from the shore; but, all these anchorages, though good with off-shore winds, are dangerous with others, and care should be taken not to be surprised by them. In case of need, vessels of deep draught may anchor about 3 miles from the shore, where good holding ground of hard mud will be found. Between the river Tronto and mount Conero, the anchorages are only good with off-shore winds or in fine weather. On coming to an anchor by night or in foggy weather along this part of the coast of Italy, it is necessary that the lead should be kept going, care being taken not to stand into a less depth than from 9 to 12 fathoms.

Between Sirolo and Ancona, the coast is high and perpendicular, with moderately deep water close to, and vessels should not anchor here except in case of necessity. Between Ancona and Rimini, the high lands of the Apennines decline to within about half a mile of the coast; and, in some places, as at Ancona and Pesaro, to the margin of the sea.

Off the coast between Ancona and Maestra point, in addition to the precaution of not approaching the shore too near, it is necessary to ascertain by the lead the quality of the bottom should a vessel bring up, for anchors frequently drag, particularly between Rimini and Maestra point, on account of the great hardness of the clay.

Chart, 200 [792].  
Var. 8° 40' W.

Between the Tronto river and Maestra point, Ancona harbour is the only place really deserving the name of a port and capable of admitting vessels of moderate draught. All the rest, formed chiefly by mouths of rivers, are scarcely available for coasters, and are, moreover, difficult of access.

The following is a brief description of them, and of the towns and villages off which vessels anchor.

Lat. 42° 57' N.  
Long. 13° 53' E.

**St. Benedetto** is a town partly situated on a hill near the sea  $3\frac{1}{2}$  miles northward of the mouth of the Tronto; it contains about 7,000 inhabitants.

**Grottamare.**—At 3 miles farther northward is the village of Grottamare, on the slope of a small hill, at the foot of which stands another village; the latter may be recognised at some distance by the tall belfry of a convent. The mouth of the Tesino, a small river of no importance, is between Grottamare and St. Benedetto.

**Marano.**—Nearly 2 miles northward of Grottamare is Marano, another village on the summit of a small hill not far from the sea.

These three villages, off which coasters anchor, are populous and carry on a considerable inland trade. The coast between the Tronto river and Marano is bordered by a bank extending about half a mile off-shore, and, in some places, by breakers which do not allow even boats to approach, except in fine weather. A vessel's position may be known when standing in by a bearing of mount Vettore, 8,123 feet high, which lies W. by S. distant 27 miles from Grottamare. This mount forms a part of the Apennine chain and is easily distinguished by its barren summit, and by several whitish peaks at a short distance from each other.

**Pedaso.**—This small village, about  $4\frac{1}{2}$  miles northward of Marano and on the right bank of the mouth of the Aso river, is another place of some commercial importance. The river, off which coasters anchor, rises at the foot of the Sibillini mountains; it is capable of receiving small craft in fine weather and when the sandbanks formed at its mouth permit.

**LIGHT.**—Half a mile south of Pedaso stands an octagonal tower and dwelling, 60 feet high, from which at an elevation of 164 feet above the sea, is exhibited a *flashing* light with alternate *white* and *red* flashes of *four seconds'* duration, *every twenty seconds*; it is visible in clear weather from a distance of 19 miles.

Lat. 43° 10' N.  
Long. 13° 44' E.

**Fermo.**—The town of Fermo, which may be recognised by a remarkable dome, is on an eminence 1,197 feet high,  $6\frac{1}{2}$  miles from Pedaso and nearly 4 miles from the sea. Vessels anchor off the village of St. Giorgio, which may be considered as the port of Fermo, and is eastward of that town; the beach on which the village stands is lower than any other part; like the rest of these places, it is only approachable in very fine weather, on account of the banks bordering it; the 5-fathoms line of soundings, is about a mile from the shore.

The Lete, a small river of no importance, disembogues one mile southward of St. Giorgio, between it and the small village of Palma, which is on high land to the southward. At  $3\frac{1}{2}$  miles northward of St. Giorgio is the Tenna, a small river accessible to boats occasionally in winter. This river taking its rise in the Sibillini mountains, is very rapid in spring and autumn, when the mud brought down by it is carried out to a considerable distance.

**San Elpidio.**—This village is  $1\frac{1}{2}$  miles northward of the mouth of the Tenna, and is the port of the town of San Elpidio, which, with its

castle, stands  $3\frac{1}{2}$  miles westward of the village on a hill 930 feet high, which is a good mark in making the land. Coasters anchor off some large storehouses on the beach. Chart, 200 [792].  
Var.  $8^{\circ} 45'$  W.

**Chienti river.**—This small river takes its rise in the Apennines, runs past Tolentino and Macerata, and, after a course of 5 miles, flows into the sea between San Elpidio and Civitanuova. Fishing-boats enter its mouth at high water.

**Civitanuova.**—The port of Civitanuova is 3 miles northward of the village of port San Elpidio and  $2\frac{1}{2}$  miles eastward of the town of Civitanuova, which stands on a hill 590 feet high and occupies the site of the ancient *Novana*. The anchorage off the village forming the port is much frequented on account of the central position of Civitanuova in a rich, populous, and well-cultivated country. Coasting vessels are built here, and provisions and water are to be obtained. Lat.  $43^{\circ} 19'$  N.  
Long.  $13^{\circ} 41'$  E.

**Potenza Picena.**—At  $3\frac{1}{2}$  miles northward of port Civitanuova is a village which is the port of Potenza Picena or Montesanto, which town, containing about 16,000 inhabitants, stands on a hill 915 feet high and 3 miles from the beach. Vessels anchor off the village close to the shore southward of the tower. At three-quarters of a mile southward of the tower is another tower at the mouth of the Asola, a small river unnavigable by reason of the mudbanks at its entrance.

**Recanati.**—On the beach,  $4\frac{1}{2}$  miles, northward of port Potenza Picena, is the village of port Recanati. Coasters anchor off some large storehouses at the village, where they can haul on shore if necessary. The large town of Recanati stands on high land 1,056 feet above the sea and 5 miles inland. The dome and tower of Loreto, on a hill 603 feet high and  $2\frac{1}{2}$  miles north-westward of the village, is a good mark for this anchorage. Lat.  $43^{\circ} 26'$  N.  
Long.  $13^{\circ} 40'$  E.

Two unimportant rivers, the Potenza and Musone, issue near the village of port Recanati; the former about half a mile southward, the latter  $2\frac{1}{2}$  miles northward of it.

**Numana and Sirolo.**—At  $5\frac{1}{2}$  miles beyond port Recanati, and in the bight formed by the coast trending north-eastward under the southern slopes of mount Conero, are the villages of Numana and Sirolo. The latter is on a hill by the sea; in case of need, vessels may anchor off it in a depth of  $6\frac{1}{2}$  fathoms, mud, sheltered by the base of the mountain from off-shore gales between North and S.W.

**MOUNT CONERO.**—The coast changes suddenly in aspect at Sirolo, where it rises and forms the great elevation known as mount Conero or Ancona, the most striking headland for many miles on this part of the coast. Mount Conero rises almost perpendicularly from Mezzaluna point, and between this point and Ancona lighthouse the range of hills, under various names, presents a front of about 7 miles in a north-west and opposite direction, mount Conero at the south-eastern extreme of the range being 1,877 feet high and double the height of any other part. On it stands an isolated telegraph tower (not in use), which serves to mark the mount at a great distance, from whatever quarter it may be approached; a convent stands half a mile south-eastward of the tower. The mountain becomes gradually depressed to the north-west, where it terminates in mount Guasco, a truncated conical hill on which are numerous buildings and the cathedral of St. Ciriaco. See view on chart, No. 200. Lat.  $43^{\circ} 33'$  N.  
Long.  $13^{\circ} 37'$  E.

Chart, 200 [792].  
Var. 8° 50' W.

**Anchorage.**—A sailing vessel overtaken by a south-westerly gale and finding it impossible to carry canvas, may seek temporary shelter on the north-eastern side of mount Conero about a quarter of a mile from the land, where there is good holding ground; this wind, however, does not generally last long and the vessel should weigh when it commences to abate.

Lat. 43° 35' N.  
Long. 13° 35' E.

**Port Nuovo** is  $2\frac{1}{2}$  miles north-westward of Mezzaluna point. This little harbour affords a safe shelter to fishing boats and others unable to reach Ancona. It is protected from northerly winds by Il Trave, a ledge of rocks which extends about  $4\frac{1}{2}$  cables in a south-easterly direction from the shore; some of these rocks are awash and mooring posts show their position; the first 3 cables of the ledge is mostly from one to 2 feet above water; the remainder, from one to 5 feet under water. The entrance is between the eastern extreme of the ledge and Bâttery point, which is skirted by rocks and shallow water. The general depths in the harbour are 4 and 5 fathoms, gravel bottom.

The harbour is open to the S.E., and, as it is mostly frequented with westerly winds, caution is necessary in approaching the land under sail, as from this quarter the wind rushes down off the high land in dangerous squalls.

**St. Clemente rocks.**—Between port Nuovo and the western extreme of the base of mount Conero, are some rocks awash, which should be carefully avoided by a vessel working along the coast and standing close in-shore under mounts della Croce and Padrone; and, the St. Clemente rocks above water, lie off Ancona point at the foot of mount Guasco. There is no passage between these latter rocks and the point, and it is always prudent to give them a wide berth as the current is strong in their neighbourhood. The Volpe, above water, is the outer north-western rock of the group, and is marked by a slender iron beacon 20 feet high; it bears N. by W.  $\frac{1}{4}$  W., distant 2 cables from Fort Monte-Marana flagstaff. These rocks are surrounded on their south-eastern and north-western sides by rocky shoals awash.

Plan of Ancona,  
3,212 [813].  
Lat. 43° 38' N.  
Long. 13° 31' E.

**ANCONA.**—This town is built on the sloping land, remarkable for the whitish appearance of its soil, between mounts Astagno and Guasco, two hills of no great height; on mount Astagno, the southernmost hill stands the citadel in the form of an amphitheatre, commanding the town and harbour; and, on mount Guasco, as before stated, is the cathedral of St. Ciriaco. See view on chart No. 200.

The town is ancient, but has grèat modern improvements and is well fortified; it is on the Adriatic coast line railway, and has almost the whole of the commerce of this part of the Adriatic. There are in Ancona and its neighbourhood many sugar refineries, silk reeling mills, paper mills, and tobacco factories, the quantity of tobacco grown in the province being much larger than that imported.

On the inner part of the mole is one of the finest remains of antiquity, the triumphal arch erected by Trajan, A.D. 112.

**Population.**—Ancona, at the census taken on February 10th, 1901, contained 56,835 inhabitants.

**Communication.**—Ancona is in direct railway communication with Rome, Naples, Bologna, and Florence; and, by frequent steamers, with Trieste, Venice, Brindisi, Egypt, &c.

**Consulate.**—A British Vice-consul is resident at Ancona.

**Hospital.**—There is a large roomy hospital here at which seamen are received by Consular request, and are maintained at the charge of 1s. 6d. per diem.

Plan of Ancona,  
3,212 [387].  
Lat. 43° 38' N.  
Long. 13° 31' E.  
Var. 8° 50' W.

**Meteorological table.**—See page 374.

**Trade.**—The imports consist chiefly of coal, jute, sugar, tallow, wood, machinery and metals, &c.; and the exports of asphalt, refined sugar, honey, sulphur, tartar, and wine-lees.

In 1904, the port was entered by 869 steam-ships and 600 sailing vessels, with an aggregate of 961,612 tons, being an increase of 104,496 tons upon the previous year.

**Repairs.**—The local shipbuilding and engineering works, situated on the site of the late Italian Government arsenal, undertake all steam factory work, and can execute the largest repairs to hull and machinery, but there is no dock accommodation, and only one small slip, suitable for coasters. There is a crane capable of lifting 20 tons and two steam-hammers; about 25 tons of iron can be melted and run at one time, and boilers of 1,000 horse power have been made.

There are three building slips at these works, upon which vessels up to a capacity of 6,000 tons cargo have been built; also a floating dock (for Venice) of 5,500 tons lifting power.

In 1904, 1,450 men were employed at these works.

**Supplies.**—Coal can always be obtained, the stock in hand of private merchants being usually about 6,000 to 8,000 tons. There is no coal wharf, but steamers on application may be allowed to coal alongside the projecting mole, where the depth is being increased to 26 feet. The coal is, however, usually brought alongside in lighters and put on board at about 26s. per ton.

Provisions are in abundance, and good water may be had from a hose on the quay, and from tank vessels.

**The Harbour** is about 6 miles north-westward of mount Conero, and is the only one in this part of the Adriatic sufficiently capacious to receive vessels of large tonnage. It is formed by a mole and breakwater, with an entrance between the two  $1\frac{1}{2}$  cables wide at the narrowest part.

The North mole projects 600 yards westward from the northern point of the harbour; this part is 33 yards wide, 68 feet high, with a battery at its end, and is called the molo Trajano; from thence, it is prolonged nearly 300 yards farther in a N.W. by W.  $\frac{1}{2}$  W. direction and near its head is a lighthouse.

The breakwater or South mole, commencing from the small shallow inner harbour surrounding the sugar refinery, projects in a N.N.W. direction for 640 yards and then curves northward for 210 yards to the extreme of its base, terminating in that direction 920 yards from the Custom-house, and having a lighthouse near its outer end; the lighthouses on the moles bear from each other N.  $\frac{1}{4}$  E. and S.  $\frac{1}{4}$  W. distant  $2\frac{1}{2}$  cables. This breakwater shelters the harbour from westerly and south-westerly winds.

The work of widening the quays and dredging is in progress, and, when finished, further berths will be available; to facilitate the discharging of coal it is proposed to construct a new breakwater and two jetties, alongside which coal vessels could discharge their cargoes direct into the railway trucks.

**Depths.**—The depth of water between the mole heads is from  $4\frac{1}{2}$  to 5 fathoms decreasing towards the shore as the harbour is entered; the depth in the northern half of the harbour is about  $4\frac{1}{2}$  fathoms. In the southern half of the harbour, the depth is less than 3 fathoms, decreasing

Plan of Ancona,  
3,212 [813].  
Lat. 43° 38' N.  
Long. 13° 31' E.  
Var. 8° 50' W.

to 2 and less than  $1\frac{1}{2}$  fathoms, towards the sugar refinery; a channel to the small harbour here was dredged to a depth of 16 feet, but in 1905, the actual depths were reported to be less than those on the chart. The bottom is everywhere dark, soft mud, except in the southern part of the harbour, where it is rocky. Bollards are provided on the moles for vessels at anchor to haul their sterns in; there are also three mooring buoys.

Vessels of war generally moor close southward of the mole, between the port office and the fort at the end of the molo Trajano, with one anchor to the southward, another to the westward, and the stern secured to the bollards before mentioned. Merchant vessels go alongside the town quays, making fast to bollards placed for the purpose. *See* remarks on winds in the road, below.

There are dolphins or nests of warping posts in the harbour, consisting of piles driven into the ground and firmly secured to each other by braces or cross pieces.

**Beacon.**—A small rock, awash at low water, lies 70 yards south-east from the head of the petroleum pier and is marked by a staff surmounted by a red cylinder.

A rock, with 3 feet of water over it (unmarked), lies about the same distance north-west of this pierhead.

**LIGHTS.**—**Mount Cappuccini.**—A *fixed* and *flashing white* light, showing a flash of *eight seconds'* duration every *forty-five seconds*, is exhibited from a cylindrical lighthouse with dwelling 65 feet high, on mount Cappuccini, three-quarters of a mile eastward of the mole head of Ancona. Eclipses not total. The light is at an elevation of 407 feet above the sea and is visible in clear weather from a distance of 26 miles when bearing from N. 38° W., through west and south, to S. 50° E.

**North mole-head.**—An *occulting red* light is shown, at an elevation of 34 feet above the sea, from a white tower 28 feet in height on the North mole-head at Ancona, visible from a distance of 9 miles; the light shows flashes of *ten seconds'* duration followed by eclipses of *five seconds*.

**Breakwater or South mole.**—Near the north extreme of the breakwater or South mole, is exhibited from a white hexagonal tower, a *fixed green* light, elevated 33 feet above the sea and visible from a distance of 4 miles.

**Santa Maria mole.**—Two *fixed red* lights, horizontal, are exhibited from the end of Santa Maria mole, visible at the distance of 2 miles.

**Semaphore.**—At the lighthouse on mount Cappuccini is a semaphore and electric telegraph station; *see* page 9.

**Wireless telegraph.**—At mount Cappuccini there is a wireless telegraph station; *see* page 36.

**Ancona road.**—The anchorage off Ancona is in depths of from 7 to 11 fathoms, muddy bottom and good holding ground; it is available only in fine weather and is seldom resorted to except by vessels prevented entering the harbour by contrary winds, or as a temporary anchorage. A good berth is in 8 fathoms, mud, the small town of Falconara bearing W.  $\frac{1}{4}$  S., and the North mole lighthouse S.  $\frac{1}{2}$  E. distant one mile.

This anchorage is exposed during Boras, which are however rarely felt at Ancona, and in north-westerly gales, which are much more troublesome, especially in the harbour where they raise such a sea as to prevent vessels loading or discharging cargo. South-easterly winds also raise a heavy sea in the road, and heavy squalls off the land are occasionally felt.

**Directions.**—Mount Conero is a good mark for vessels approaching Ancona either from the north or from the southward; in clear weather, mount St. Vicino, situated 27 miles S.W. by W.  $\frac{1}{4}$  W. from the town and one of the highest (4,875 feet) of the Apennine chain, whose conical shape is remarkable, may also be seen from the offing. In foggy or hazy weather, however, when coming from the eastward or from the coast of Dalmatia, care should be taken not to mistake mount Ardizza, near Pesaro, for mount Conero; the latter is higher, and may, moreover, be easily distinguished by the objects on it already described; portions of the land near it are not unlike the high ground in the vicinity of the Needles, Isle of Wight.

Plan of Ancona.  
3,212 [813].

On nearing the land, the lighthouse on mount Cappuccini will be recognised; then the town, and lastly the North mole-head. Care must be taken to guard against the current, which sets strongly south-eastward in the vicinity of Ancona point. At night, the *red occulting* light on the North mole-head kept southward of S.W. leads one cable westward of the Volpe and its surrounding rocks. In rounding the North mole-head at night, a berth of at least half a cable should be given it, and after entering the harbour, a vessel should anchor according to her draught. The *fixed green* light on the breakwater or South mole should be given a berth of three-quarters of a cable.

**COAST.**—From Ancona the shore is low and sandy as far as the town of Senigallia, about  $13\frac{1}{2}$  miles north-westward of Ancona; it is intersected by several rivers, of which the most important is the Esino,\* which has its source in the Fabriano mountains and runs into the sea about  $5\frac{1}{2}$  miles from Ancona. Fishing boats may ascend the river at high water. It has been already observed that this shore is bordered by shallow water to the distance of half a mile, at which distance the depth is from 2 to 3 fathoms; it should, therefore, be carefully avoided.

Chart, 200 [792].  
Var. 9° W.  
\*Lat. 43° 38' N.  
Long. 13° 23' E.

The high lands which serve to distinguish this part of the coast, are Montagnola, 863 feet high, and in the shape of a sugar loaf, about 2 miles south-westward of Ancona, with a tower and a few houses on its summit; mount Bercaglione, 673 feet high, one mile from the shore, and 3 miles north-westward of Montagnola, with a convent and some houses on it; and mount Falconara, which is higher than Montagnola, and of similar shape, with numerous buildings and a castle on its summit; it is south-eastward of and about a mile from the mouth of the Esino river; the railway from Foligno joins the main coast line at the foot of this mountain, between it and the sea.

**SENIGALLIA.**—The town of Senigallia (ancient *Sena Gallica*), is at the margin of the sea on the right bank of the Misa river, between two fertile hills; it is large, and remarkable for its ancient ramparts and capacious storehouses which served as depôts for merchandise of every kind in July and August when the great annual fair used to be held, but which was suppressed in the year 1870.

Plan of Senigallia,  
on chart, 200 [792].  
Lat. 43° 43' N.  
Long. 13° 14' E.

The town has a population of about 23,000. Provisions and water may be obtained in abundance. Vessels up to 150 tons are built here.

**The Harbour** is at the mouth of the Misa river, the stream from the bridge downwards being confined between the two quays bordering its banks for a distance of about 3 cables. At the entrance, the stone quays are prolonged by wooden pile piers; the eastern pier is nearly a cable in length, is the longer of the two, and has a lighthouse both at its outer and inner ends. The width between the quays and also between the piers is only about 70 feet. The railway crosses the harbour by a swing bridge

Chart, 200 [792],  
with plan of  
Senigallia.  
Var. 9° W.

half way between the town bridge and the entrance ; between the bridges the average depth is only 4 to 6 feet ; below the railway bridge from 6 to 7 feet ; and in the entrance, about 6 feet. The harbour is capable of holding many coasting craft, which have to be well secured to the quays on account of the rapidity of the stream during freshets.

**LIGHTS.**—**East pier.**—**Inner end.**—A *fixed white* light visible in clear weather from a distance of 8 miles is exhibited, at an elevation of 47 feet above the sea, from an octagonal brick tower and dwelling, 39 feet high, at the extreme of the stone mole, and at the inner end of the wooden pier, on the eastern side of entrance to the port of Senigallia.

Lat. 43° 43' N.  
Long. 13° 14' E.

**East pier-head.**—From a grey wood structure, 13 feet in height, on the East pier-head is exhibited a small *fixed red* light, elevated 22 feet above the sea, and visible from a distance of 3 miles, which is changed to *green* when Misa river is so swollen as to prevent entry.

The two lights in line show the direction of the line of approach.

**Directions.**—In clear weather, the peaks of Catria or Caia mountain, 5,581 feet high, may be seen from a great distance and are useful in making the land when bound to Senigallia ; this mountain bears about W.S.W. 27 miles from the town and has a forked summit. On a nearer approach, the village and steeple of Scapezzano, on a hill 613 feet high, and 2 miles W. by N. of Senigallia, will be seen ; also, the village and tower of Albani on another hill 2 miles to the southward ; and, lastly, the town of Senigallia and the lighthouses on the East pier, which should be brought to bear about S. by W. when  $1\frac{1}{2}$  miles distant and the soundings about 4 or 5 fathoms.

There is a depth of from 6 to 7 feet at high water in the passage between the piers, but the banks at the mouth of the river occasionally change their position. In fine weather, coasters anchor off the harbour about 3 cables north-eastward of the pierheads.

Plan of Fano on  
chart, 200 [792].  
Lat. 43° 51' N.  
Long. 13° 1' E.

**FANO.**—The coast from Senigallia to Fano,  $11\frac{1}{2}$  miles farther north-westward, is bordered by a bank, the 5-fathoms contour-line being about one mile from the shore. Within this space, the Cesano river, which rises at the foot of mount Catria, and the Metauro which descends from the Apennines, reach the sea, and their volume and strength are often so great that the mud brought down by them discolours the water to a great distance ; neither of these rivers are navigable.

**The town** of Fano is surrounded by well cultivated hills. Its numerous edifices and steeples give it the appearance of a large town ; it has about 20,000 inhabitants, contains large silk manufactories, but affords few supplies for shipping.

**The port** of Fano is at the mouth of the northern arm of the Metauro, which, straightened and embanked, is named the Chiuse canal and joins the Metauro proper about 4 miles inland ; along the banks of the harbour are quays but little frequented, the harbour being so encumbered by sand as to render it often impracticable for even the smallest vessels. The bed of the port is a mixture of gravel, mud, and large stones. The entrance lies in a S. by W. direction between two moles ; and, from the shore eastward of the eastern mole, is a protective mole or breakwater extending nearly a cable in a north-easterly direction. The coast-line railway crosses the harbour only  $2\frac{1}{2}$  cables within the mole. Large vessels anchor in fine weather  $1\frac{1}{2}$  miles from the shore. Viewed from about 8 miles eastward, the bridge over the southern arm of the Metauro may be seen to the left of the town of Fano.

**LIGHTS.**—From a circular reddish tower and dwelling, 51 feet high, situated 175 yards within the mole head on the eastern side of the entrance of Fano, is exhibited at an elevation of 58 feet above the sea, a *fixed white* light, visible in clear weather from a distance of 10 miles. Plan of Fano on chart, 200 [792].  
Var. 9° 5' W.

A *green* lantern light is hoisted on a pole at the end of this mole, in fine weather only.

A *fixed red* light is exhibited from a masonry turret, 19 feet high, placed about 40 yards from the outer end of the protective mole, eastward of the eastern mole of the harbour; it is elevated 27 feet above the sea, and visible from a distance of 4 miles.

**COAST.—Landmark.**—Mount Catria, the high forked mountain before alluded to, is a good mark in making this part of the coast; on nearing the land, vessels will be guided by mount Giove, 840 feet high and about 3 miles south-westward from Fano, on the summit of which is a large monastery with a high steeple; also, by mount Novillara, 780 feet high, with a small village and a round tower on its wooded summit, which latter lies west-north-westward, 4 miles from Fano; and, lastly, by the town of Fano. Chart, 200 [792].

From Fano, the coast suddenly rises, the hills from mounts Novillara and Ardizza, situated  $1\frac{1}{2}$  miles south-east of Pesaro, extending to the margin of the sea, and here the coast line railway leaves the shore and, skirting the southern side of Pesaro, passes through the valley in the rear of these hills. When seen in line from a distance, mounts Novillara and Ardizza resemble Conero; they are lower than the latter, but, like it, their greatest height is on the south-east; they become depressed towards the north-west, where mount Ardizza terminates in a perpendicular cliff on which stands a house with a semaphore. The coast from Fano to Pesaro, about  $6\frac{1}{2}$  miles distant, is bordered by a bank which extends half a mile from the shore, at which distance there is a depth of 2 fathoms.

**PESARO.**—The town of Pesaro stands near the seashore in the valley formed by mount Ardizza, and by a chain of hills stretching north-westward, of which mounts Fiorenzuola and Mezzo, distant 4 and 5 miles respectively from the town, are the highest, the latter being 755 feet above the sea. This place contains silk, porcelain, crystal, and other manufactures; its population at the census in February 1901, was 25,103. Plan of Pesaro on chart, 200 [792].  
Lat. 43° 55' N.  
Long. 12° 55' E.

**The Port.**—The main or river entrance to the port is the mouth of the Foglia river, which takes its rise at the foot of mount Sasso Simone. The entrance channel trends in a S. by E.  $\frac{1}{2}$  E. direction between a mole and the land westward of it for about three-quarters of a mile; thence it curves to S. by W.  $\frac{1}{2}$  W., which is its direction at the bridge, at which point the fortifications of the town abut on the river. The depth at the entrance was formerly about 6 feet, sandy bottom, gradually decreasing through the greater part of the channel to near the bridge, where there was less than 2 feet water. By the plan this entrance appears to have silted up; sandbanks form and disperse at and off the entrance according to the direction of gales of wind. The port shelters a large number of small coasting vessels.

At 2 cables eastward of the river entrance is another opening between two piers or jetties, also shallow, about  $4\frac{1}{2}$  feet water being the depth just at the entrance, and 6 feet within; near the head of the eastern mole of this entrance is the lighthouse. This basin does not communicate with the main river, but forms an artificial harbour.

Chart, 200 [792].  
with plan of  
Pesaro.  
Var. 9° 10' W.

Mounts Ardizza and Fiorenzuola, each crowned by a village, serve as marks for Pesaro. On approaching the coast, the town and lighthouse will be seen.

Vessels of deep draught may anchor in fine weather at  $1\frac{1}{2}$  miles from the land, in a depth of  $5\frac{1}{2}$  or  $6\frac{1}{2}$  fathoms, mud.

**LIGHTS.—Eastern entrance.**—On the East mole, 47 yards within the extremity, a *fixed white* light is exhibited from an octagonal red tower at an elevation of 48 feet above the sea, visible in clear weather from a distance of 10 miles.

From a post situated 10 yards within the extremity of the same mole, a *fixed red* light, elevated 20 feet above the sea, is exhibited, which is visible from a distance of 3 miles.

On the West mole, 13 yards within its extremity, from a grey shed with an iron mast, a *fixed green* light is exhibited, elevated 20 feet above the sea, and visible at a distance of 5 miles.

A small *fixed red* light marks the outer extremity of works in progress at the harbour entrance.

Chart, 200 [792].

**THE COAST** from Pesaro to Rimini, a distance of 17 miles, is intersected by many streams and rivers, of which the Conca is the only one of any importance, fishing boats being able to ascend it at high water. Westward of the high land of Fiorenzuola and Mezzo the coast forms a slight bay: near its shore is the village of Cattolica. Small vessels anchor off the shore between the mouth of the Conca and Gabice village, and are sheltered from westerly and southerly winds by the land of mount Mezzo, but are quite exposed to those from S.E., round by east, to N.W.; south-westerly winds give rise to violent squalls.

Lat. 43° 58' N.  
Long. 12° 48' E.

**LIGHT.—Castel di Mezzo.**—Near a point about 5 miles north-west of Pesaro stands a cylindrical lighthouse with one-storey dwelling attached, 62 feet in height, from which at an elevation of 230 feet above the sea, is exhibited a *flashing white* light, visible in clear weather from a distance of 22 miles, when bearing from N. 55° W., through west, to S. 45° E. Duration of flash *two seconds*; eclipse *eight seconds*.

**Cattolica** is situated 2 miles westward of Castel di Mezzo, on the main coast railway line which here again approaches the shore. In approaching the anchorage off Cattolica from the north-eastward, a vessel has on her port bow the high hills of Gradara and Luro, on the summits of which are some steeples visible at a considerable distance; also mounts Fiorenzuola and Mezzo, whose bases are washed by the sea. On nearing the coast, Cattolica and the tower at the mouth of the Conca will be seen.

**Light.**—At the end of the small wooden jetty at port Cattolica is a grey octagonal wooden turret, from which is exhibited, at an elevation of 26 feet above the sea, a *fixed* light, visible at the distance of 5 miles, showing *red* seaward and *white* inshore.

**Canale di Riccione.—Light.**—At about  $4\frac{1}{2}$  miles north-westward of Cattolica, on south side of entrance of the Canale di Riccione, a *fixed* light is exhibited, visible at the distance of 3 miles, and showing *white* to seaward, *red* to northward, and *green* to the southward.

Plan of Rimini on  
chart, 200 [792].  
Lat. 44° 4' N.  
Long. 12° 35' E.

**RIMINI.**—The town of Rimini (ancient *Arminium*), stands at the foot of fertile hills on the right bank of the Marecchia, a river which rises in the Apennines; its harbour, at the mouth of that river and formed in its channel, was formerly of great celebrity. A fine marble bridge of five arches,

No. 1590.—PORT RIMINI—LIGHT ESTABLISHED.

*Position.*—On outer end of west mole.

*Details:*

*Character.*—An *occulting green light every two seconds*, thus:—

Light,	eclipse.
$\frac{1}{1}$ sec.	$\frac{1}{1}$ sec.

*Elevation.*—25 feet.

*Visibility.*—4 miles.

*Structure.*—Black iron post on cement hut.

*Remarks.*—The light is unwatched.

Chart No. 200.

Med. 3, p. 75.

No. 206.—PESARO—ALTERATION IN CHARACTER OF LIGHT.

*Position.*—At a distance of 47 yards within the head of the East mole in the Eastern entrance.

Lat.  $43^{\circ} 55\frac{1}{2}'$  N., long.  $12^{\circ} 54\frac{3}{4}'$  E.

*Details.*—The fixed white light has been replaced by a *group flashing white light showing three flashes every twenty seconds*, thus:—

Flash,	eclipse,	flash,	eclipse,	flash,	eclipse.
$\frac{4}{10}$ secs.	$\frac{4}{10}$ secs.	$\frac{4}{10}$ secs.	$\frac{4}{10}$ secs.	$\frac{4}{10}$ secs.	$\frac{9}{10}$ secs.

*Remarks.*—The light has a visibility of 12 miles; the other details of the light remain unchanged.

Chart No. 200.

Med. 3, p. 74.

No. 575.—CASTEL DI MEZZO—ALTERATION IN CHARACTER OF LIGHT.

*Position.*—Lat.  $43^{\circ} 57\frac{1}{2}'$  N., long.  $12^{\circ} 48\frac{1}{2}'$  E.

*Alteration.*—The flashing white light has been replaced by a *group flashing white light showing two flashes every thirty-two seconds*, thus:—

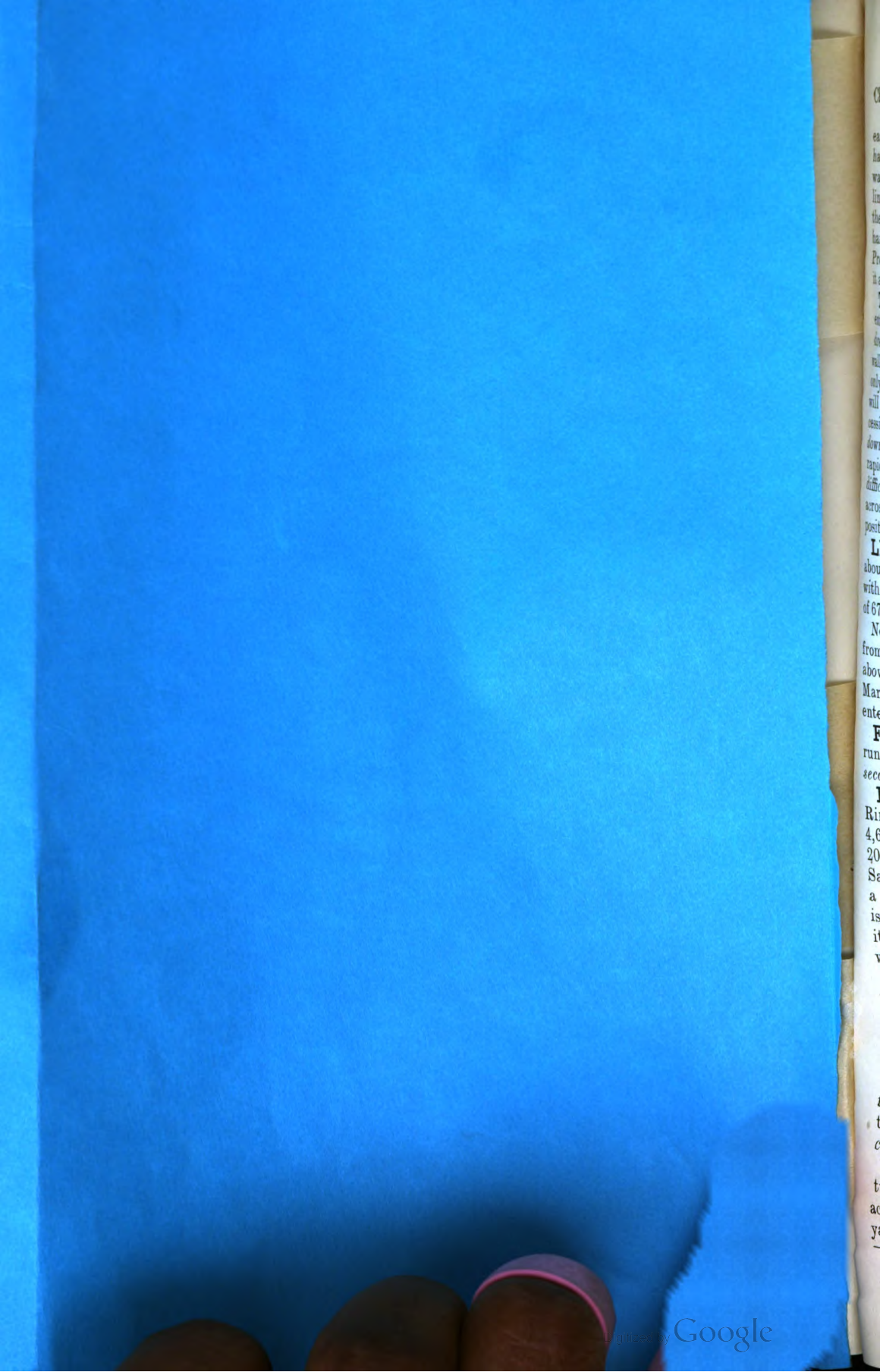
Flash,	eclipse,	flash,	eclipse.
$1\frac{4}{10}$ secs.	$6\frac{6}{10}$ secs.	$1\frac{4}{10}$ secs.	$22\frac{6}{10}$ secs.

*Remarks.*—The other characteristics of the light remain unchanged.

*Caution.*—See Notice No. 573 of 1915; this light is at present extinguished.

Chart No. 200.

Med. 3, p. 74.



each arch having a span of 27 feet, crosses the river at the head of the harbour, and a triumphal arch erected to Augustus still exists. It is a walled town, with a population of about 38,000; it stands on the main coast line railway, which crosses the river between the town and the sea, from thence turning inshore and finally quitting the coast of the Adriatic. Rimini has silk and sulphur factories, and building yards for small vessels. Provisions, water, and ship's stores in small quantities, can be procured: it also carries on a trade in salt fish.

Plan of Rimini on  
chart, 200 [792].  
Var. 9° 20' W.

**The Harbour** is navigable for small craft for about a mile from its entrance. Two moles extending  $1\frac{1}{2}$  cables from the shore in a N.N.E. direction, form the entrance channel, which is bordered by quays up to the walls of the town. The depth is about 6 feet in the entrance, and in places, only about half that depth can be carried up to the town. The harbour will contain numerous small vessels, moored to the quays; but, after excessive rains, it is frequently encumbered by gravel and flints brought down by freshets, and at such times the stream is sometimes sufficiently rapid to cause vessels moored to the quays to break adrift. It is likewise difficult for sailing craft to approach, owing both to the strong current across the entrance and to the banks off it, which frequently vary in position.

**LIGHTS.—East mole.**—On the eastern side of entrance channel about 250 yards within the inner end of the mole, from a square brick tower, with two terraces 59 feet high, a *fixed red* light is exhibited at an elevation of 67 feet above the sea, visible in clear weather from a distance of 12 miles.

Near the outer extremity of the East mole a *fixed white* light is exhibited from a white wooden turret with copper cupola, at an elevation of 25 feet above the sea, visible from a distance of 5 miles. When the river Marecchia overflows, this light is extinguished, it then being dangerous to enter. The outer light bears N. by E.  $\frac{1}{2}$  E. from the inner light.

**Fog signal.**—During thick or foggy weather, or in freshets, a bell is rung by machinery at the outer light, giving one stroke at intervals of *fifteen seconds*; it can be heard from a distance of about one mile.

**Directions.**—When standing in for the land in the vicinity of Rimini in clear weather, vessels will sight the Carpegna mountains, 4,616 feet high, with flat summits and wooded sides, lying south-westward 20 miles from the entrance to the port; and, southward of them, mount Sasso Simone, which is lower and has the appearance of being crowned by a wall. Mount San Marino, 2,454 feet high, next appears in view, and is easily distinguished by its height, and by the houses and four towers on its summit. The town of Rimini is afterwards seen, and then the lighthouse, which should be steered for.

Chart, 200 [792].

**THE COAST** from Rimini to Cesenatico, about 11 miles farther north-westward, is sandy, very low, and difficult of access even for fishing-boats, owing to the banks formed by the numerous streams which run into the sea within this space. Of these, the river Uso, the entrance to which is 6 miles north-westward from Rimini lighthouse, may be ascended by fishing-boats at high-water when the sea is smooth. The village and tower of Pedrera, as well as Bellaria and its tower, which latter stands at the mouth of the Uso, are the only remarkable objects on this part of the coast.

**Cesenatico.**—This small harbour is an artificial channel formed by two piers projecting seaward at right angles to the shore, and is difficult of access owing to banks at the entrance. The south-east pier is about 200 yards in length; works are in progress extending the other pier. It will

Lat. 44° 12' N.  
Long. 12° 25' E.

Chart. 200 [792].  
Var. 9° 20' W.

contain many small coasting craft, and is the chief harbour on this part of the coast; it is, however, silting up, and at low water, the depth is not more than about  $3\frac{1}{2}$  feet, with a muddy bottom. Cesenatico is the port of the town of Cesena, which town stands on a hill 545 feet high, at the foot of the Apennines, and is about 8 miles westward of the port; its population is about 3,500.

The Carpegna mountains, before described, south-south-westward of Cesenatico village, are good landmarks for pointing out its position; as is also mount San Marino.

**LIGHTS.**—Two *fixed white* lights are exhibited from iron supports on turrets (outer painted grey, inner red) on the south-eastern side of the entrance to Cesenatico; the outer light 11 yards within the end of the mole, elevated 26 feet above the sea, is visible from a distance of 5 miles; the inner light 225 yards from the end, at an elevation of 41 feet above the sea, is visible in clear weather from a distance of 8 miles.

The end of the north-west pier (in progress) is marked by a *fixed green* light, the end of the south-east pier by a *fixed red* light.

**Fog signal.**—During thick or foggy weather a bell at the outer light-turret is struck once every *fifteen seconds*.

Lat. 44° 16' N.  
Long. 12° 22' E.

**Cervia.**—The entrance to this little port is 4 miles northward of Cesenatico; it is formed by an artificial channel, which collects the waters from the surrounding mountains, retaining those of the sea by means of a sluice. Surrounded by salt marshes, it is almost silted up, there being scarcely  $1\frac{1}{2}$  feet in it at low water. The town of Cervia stands on the right bank of the channel and contains about 7,000 inhabitants, who are chiefly occupied in preparing salt from the marshes; about 50,000 tons are annually produced. The salt is kept in large storehouses and constitutes almost the entire trade of the town.

As before stated, mounts Carpegna and San Marino serve as excellent marks in making the land in this vicinity. On approaching the harbour, either the lights by night or the position of the village of Cervia by day at the south-eastern extreme of a large pine forest, sufficiently indicate the course for boats steering for the entrance channel.

**LIGHTS.**—A *fixed white* light, elevated 49 feet above the sea, visible in clear weather from a distance of 8 miles, is exhibited within the entrance, 317 yards from the pier-head and on the south-eastern side, from an octagonal red tower, 41 feet in height.

A *fixed white* light, elevated 14 feet above the sea, visible from a distance of 8 miles, is shown at the end of the south-east piers.

**Coast.**—The vast pine forest which commences 2 miles southward of Cervia, covers the coast for about 18 miles, extending nearly as far as Primaro and for about 2 miles inland. The whole of this extent of coast is sandy, low, and everywhere intersected by marshes and streams which render it uninhabitable. The high lands bordering the coast nearer Ancona disappear almost entirely northward of Cervia, nor are the Apennines any longer seen at a short distance inland.

Between Cervia and Ravenna, distant  $10\frac{1}{2}$  miles, access to the coast is obstructed by banks of mud and sand brought down by the Savio river, which reaches the sea 3 miles from Cervia, and by the Ronco or Montone, the mouth of which, accessible to small fishing boats, is about half a mile southward of the parallel of Ravenna. About a mile from the shore there is a depth of  $2\frac{1}{2}$  fathoms.

**Bevano bay.—Anchorage.**—The coast between the Savio and the Montone forms the slight bay of Bevano; at its head is a small stream of that name and a marsh which is gradually filling up. Coasting vessels anchor in this bay northward of Savio point, which slightly protects them against southerly winds. Bevano tower on the south, in the middle of the marsh, and Torrazza tower on the north, point out the position of the bay.

Chart, 200 [792].  
Var. 9° 20' W.

**RAVENNA.**—This town, which originally stood on the sea shore, is now between 4 and 5 miles from the coast, and on the border of the forest before mentioned. It is a large town, containing, at the census of 1901, 64,031 inhabitants, with a silk manufactory and rather an important trade. The country around is marshy; fresh water is very scarce.

Lat. 44° 25' N.  
Long. 12° 13' E.

The harbour no longer exists, and its remains, 2 miles north-westward of the mouth of the Ronco or Montone, are scarcely to be traced. On approaching the land near Ravenna from the eastward, the water shoals regularly; the coast line being very low, the domes and towers of the churches of Ravenna are distinctly seen amidst the surrounding trees at the distance of 8 miles from the shore.

Corsini, 5½ miles northward of the mouth of the Ronco, now serves as the port of Ravenna, the communication between the two being by canal. Ravenna itself is the terminus of a railway which communicates through Imola with Bologna, and thus with the general Italian system.

**PORT CORSINI** is merely the mouth of the canal, which commences at Ravenna, and during a course of 6 miles is fed by the waters of the neighbouring marshes. Vessels of 70 or 80 tons ascend it with the flood as far as that town. The depth of water at the entrance is preserved by two moles, about 120 feet apart, which project seaward in an east direction upwards of 650 yards, the southern mole projecting rather beyond the other. The depth in the channel to Corsini is 13 feet, and a depth of 9 feet may be carried up to Ravenna. Near the mole head on each side is a lighthouse; and on the southern side of the canal, about half a mile within the harbour entrance, is the main lighthouse and also the pilot station.

Plan of Corsini on  
chart, 200 [792].  
Lat. 44° 29' N.  
Long. 12° 18' E.

**LIGHTS.**—On the southern side of the Corsini canal, 480 yards from the coast and about half a mile within the lighthouse near the South mole head, is the main lighthouse, an octagonal white tower above a three-storey dwelling, from which, at an elevation of 87 feet above the sea, is exhibited a *fixed and flashing white light*, showing a *flash of six seconds' duration every half minute*, and visible in clear weather from a distance of 15 miles.

**North mole.**—About 37 yards within the North mole head, a *fixed green light*, elevated 22 feet above the sea, is shown from a small iron house, painted grey.

**South mole.**—About 30 yards from the end of the South mole, a *fixed red light* is exhibited from a small iron house painted grey, at an elevation of 23 feet above the sea, visible from a distance of 6 miles.

**Fog signal.**—In thick or foggy weather, a bell at the end of the South mole is struck by machinery once every *twenty seconds*.

**Tidal-stream lights** are exhibited from the top of the main lighthouse to show the direction of the stream:—

- (a.) Two *red lights*, placed vertically, denote that the stream is running in.
- (b.) Two *red lights*, placed horizontally, denote that the stream is running out.

Plan of Corsini on  
chart, 200 [792].  
Var. 9° 25' W.

**Semaphore.**—There is a semaphore station at the main lighthouse, in connection with the telegraphic service; see page 9.

**Directions.**—The main light bears from the South mole light, West, and the two lights in line lead up to the entrance.

Chart, 200 [792.]

In standing in to make the land at Corsini, or anywhere on this part of the coast, which is flat and only visible at a short distance, Bertinoro is the first town sighted, and that before the pine forest on the coast is seen; it stands on mount Capuchin, a hill 1,115 feet high, 12 miles westward from Cesenatico and about 16 miles south-south-west from Ravenna, which latter subsequently appears behind the trees, and, lastly, on the beach are seen the houses of Corsini, and the main lighthouse, which stands quite alone.

The only remarkable object between Corsini and Primaro, 6 miles northward of it, is an isolated tower 3 miles from the entrance to Corsini pointing out the mouth of the river Lamone, which river is generally choked by sands at its entrance.

Lat. 44° 35' N.  
Long. 12° 19' E.

**COAST.—Po di Primaro.**—Vessels of 70 or 80 tons ascend this river as far as the Faenza channel, distant 9 miles from the coast, and those of 18 or 20 tons ascend to Tragetto, 20 miles farther; though not considered one of the mouths of the Po it is in fact connected with that river and is a continuation of the Reno. On the southern side, near the mouth of the river, is an electric telegraph station.

The entrance is obstructed by banks extending some distance off-shore, through which the depth is only about 6 feet at low water; these banks occasionally change their position. The entrance should only be attempted with the flood tide.

Some buildings close to Primaro, the round tower 2 miles to the south, and two tall trees on the northern side of the entrance, point out its position. The village of St. Alberto, on the right bank of the river and 8 miles from the sea, is the centre of the trade of Ferrara with the coast; it possesses good storehouses and provisions are abundant.

**The Coast** northward of Primaro is a mere strip of low land, occasionally cultivated but generally consisting of a series of small sand-hills, which separate the sea from the great Comacchio lagoon. The lagoon, fed by the waters of the sea which enter at port Magnavacca, leading to the Pallotta canal, embraces an area of 150 square miles and has a depth of about 3 feet in every part over a clay bottom.

**Comacchio.**—The small fortified town of Comacchio, in the midst of unhealthy salt marshes, is on the Pallotta canal, about 2½ miles from the coast and surrounded by canals on every side. Its inhabitants, about 10,000, carry on a considerable trade in salt fish, and particularly in eels, with which the lagoon abounds. Provisions are plentiful, but water is scarce; fishing-boats are constructed here.

**Magnavacca.**—The lagoon is entered at port Magnavacca, and from thence, vessels proceed by the Pallotta canal to Comacchio. The waters of this canal are influenced by the tide, and during the months of February, March, and April, their depth increases by about 2 feet. Vessels of not more than 50 tons enter port Magnavacca, and smaller ones ascend with the tide as far as Comacchio.

A red tower nearly 1½ miles westward of the entrance to port Magnavacca, the church steeple of Comacchio about 3 miles north-westward, and the semaphore of Primaro, indicate the position of the entrance to the port.

**LIGHTS.**—Near the mole at the northern side of the entrance to Magnavacca, at 214 yards from the extreme of the piles, a *fixed white* light is exhibited from an iron mast over a shed, at an elevation of 35 feet above the sea, visible in clear weather from a distance of 10 miles. Chart, 200 [792].  
Var. 9° 25' W

At about 27 yards from the extreme of the piles, from a red hexagonal turret, another *fixed white* light is shown, elevated 17 feet above the sea, and visible from a distance of 3 miles.

**Anchorage.**—Vessels anchor in a depth of 5 fathoms about  $2\frac{1}{2}$  miles from the coast, half way between Magnavacca and Volano, which latter is 8 miles farther northward. The anchorage is good with off-shore winds but exposed to those from between N.E. and South. In approaching this low shore the lead should be kept going.

**THE DELTA OF THE PO**, or so much of it as protrudes beyond the general trend of the coast line, may be considered to begin 2 miles northward of Volano and extend northward to port Caleri, a direct distance of about 16 miles, but 30 miles as measured by the coast. The soil brought down by the river and deposited in the sea, has, in the course of ages, greatly changed the outline of the coast, and the eastern extreme, near Maestra point, is about 8 miles in advance of the natural line of shore; this change and extension is still in progress and, in 1886, the Italian survey of this coast showed that a depth of 16 feet was all that existed at  $2\frac{1}{2}$  miles S.E. by E.  $\frac{1}{2}$  E. from Maestra point; at the present time the depth of 18 feet is reported to lie 3 miles E.S.E. from the lighthouse. So rapid and uncertain is this extension that no vessel navigating these waters should approach the coast between the mouths of the Po delle Tolle and the Po di Maestra nearer than 4 miles nor within a less depth than 16 or 17 fathoms. The general character of the land is that of a low flat marsh. Lat. 45° 0' N.  
Long. 12° 30' E.  
Charts, 200 [792].  
201 [793].

**THE RIVER PO.**—The various mouths of the Po, which may be considered to be eight in number, embrace an extent of about 26 miles of coast, including the Po di Volano on the south and the Po di Levante on the north. Lat. 44° 55' N.  
Long. 12° 30' E.

The river has its source in the Grisons Alps at Monte Viso, and after flowing 280 miles eastward from Turin reaches the gulf of Venice, receiving in its course the waters of several small tributary streams. Lombardy, which it intersects, is composed entirely of an alluvial, black fertile soil of great depth, and is one of the richest plains in the world.

From Piacenza to Papozze and Serravalle villages, 19 miles below Ponte-lagoscuero, the port of Ferrara, the river flows between embankments; it bears the name of Po Grande until it reaches these villages, when besides the smaller branches presently named, it divides into the Po di Maestra and the Po di Goro, now the chief navigable branches.

The Po di Volano is the southernmost branch of the river; next comes the Po di Goro and Po della Gnocca flowing into the sea through projecting low land which separates Goro road from Pelazza bay. Between Pelazza bay and Maestra point, there are three mouths which lead to the Po delle Tolle, a continuation and the outlet of the Po Grande or Po di Maestra. These mouths are the Busa del Bastimento, the Po del Canerino, and the Busa della Pila; they contain numerous sandbanks, and, as there are scarcely any recognizable objects, the navigation of them is difficult even for those with local knowledge. Northward of Maestra point are several small entrances and the principal mouth of the Po di Maestra; and, lastly, the Po di Levante the northernmost of all.

Charts, 200 [792],  
291 [793].  
Var. 0° 25' W.

**Depths.**—The four practicable passages have but sufficient depth for small craft. The Po della Pila, the easternmost mouth by the chart, has about 4 feet water over the bar at the entrance, but there are depths of 2 to 4 fathoms in the Po delle Torre with which it communicates. The other entrances are apparently still shallower, though the Goro is said to have 6 feet in the entrance; the chart shows a dry flat in front of it. They are only available with the assistance of a pilot. *See* details following.

Lat. 44° 48' N.  
Long. 12° 17' E.

**Port Volano** is the outlet of the Po di Volano, the southernmost branch of the river Po, which runs into the sea on the western shore of Goro road. This branch of the river, after receiving the waters of the Poatello and of the various canals which unite under the walls of Ferrara, is called the Po di Volano. Small coasting craft ascend it to the village of Codigoro, where a few supplies may be obtained; and from thence they go up to Ferrara.

A tower and a few houses indicate the entrance of port Volano; also, a large forest of pine and oak trees, which, beginning at the tower, extends  $4\frac{1}{2}$  miles northward. The entrance is round a tongue of sand which runs parallel with the coast and extends nearly  $1\frac{3}{4}$  miles northward of the tower.

At  $2\frac{1}{4}$  miles southward of Volano tower is a small entrance into the lagoons known as port Bianco.

Lat. 44° 47' N.  
Long. 12° 19' E.

**Goro road**, or Sacca dell' Abate, is the bay 3 miles deep and of semicircular shape, commencing at port Volano and terminating in the low land at the mouth of the Po di Goro. The whole of the bay is encumbered by soil deposited by the several mouths of the Po. The anchorage in Goro road, off the central part of the bay, affords good shelter against winds from E.N.E., round by north, to S.W.; the bottom is a mixture of mud and clay, and it is often difficult to weigh the anchor when the precaution of occasionally sighting it has not been taken.

In seeking shelter here, it must be borne in mind that shallow anchorage ground extends a long way outside the limits of the bay. With Goro lighthouse bearing N.E.  $\frac{1}{2}$  E. distant  $3\frac{1}{2}$  miles, the depth is only about  $5\frac{1}{2}$  fathoms; farther in towards the bay, with the lighthouse E. by N.  $\frac{1}{2}$  N. 3 miles, the depth is  $3\frac{1}{2}$  fathoms; and, in line between the lighthouse and Volano tower, the depth is only 9 feet.

Lat. 44° 47' N.  
Long. 12° 24' E.  
Chart, 201 [793].

**The Po di Goro** is that branch of the river which leaves the main stream about a mile westward of the village of Sta. Maria in Punta, and flows into the sea at the south-eastern extreme of Goro road, after a course of about 26 miles. Between its mouth and its point of junction with the main stream of Po Grande, are the villages of Gorino, Goro, Mesola, and Ariano. Above the junction, small craft ascend as far as Ponte-lagoscuero, from whence the channel is taken for Ferrara.

**Depths.**—At the entrance of the Po di Goro there is a depth of about 6 feet, but the sand and mud brought down by the river cause the depths to be very changeable. The channel is generally marked by poles for those locally acquainted.

Near Goro point is the lighthouse presently described, and a large building with red roof situated  $5\frac{1}{2}$  cables eastward from it. About  $2\frac{3}{4}$  miles north-north-westward from the lighthouse is the church steeple of Gorino; and, nearly 9 miles west-north-west of the lighthouse, the tall steeple of Pomposa, terminating in a sharp point, with Volano tower to the left of it. These objects serve to identify the land.

**LIGHT.**—The lighthouse on Goro point is on the south-western side of the entrance to the Po di Goro; it is a white conical tower rising from the keeper's house, 59 feet high, and exhibiting, at an elevation of 60 feet above the sea, a *fixed and flashing* light with a period of *fifteen seconds*, visible in clear weather from a distance of 14 miles, and showing thus:—*Fixed white*, with *red flashes*, when bearing from S. 47° E., through east and north, to S. 73° W.; *fixed red*, with *red flashes*, from S. 73° W., through south, to S. 47° E., except between S. 2° W. and S. 17° W., where it is obscured. This light is very useful to vessels seeking shelter in Goro road in a Bora. See view of lighthouse on charts Nos. 200 and 201.

Chart. 201 [793].  
Var. 9° 25' W.

**The Po Della Gnocca** is a branch of the Po which enters the sea about 1½ miles north-eastward of Goro point. Its mouth is generally preferred by boats proceeding to Venice by the inland channels, in order to avoid rounding Maestra point and the navigation of a difficult, and, in the winter season, dangerous coast. The shoals off the mouth frequently shift their position; piles are placed to indicate the channel, which has about 5 feet water, but deepens considerably within.

Lat. 44° 48' N.  
Long. 12° 25' E.

Pellazza bay is a large shallow indentation north-eastward both of the Po di Goro and della Gnocca and open to the S.E. From a depth of 2 fathoms at 1½ miles southward of Goro lighthouse, the same soundings trend in an east-north-east direction across the mouth of the bay and 1½ miles south-eastward of the mouth of the Po delle Tolle.

**Anchorage.**—There is good anchorage in northerly and westerly winds in a depth of about 5 fathoms, with Goro lighthouse in line with a large red-roofed building, bearing W. by N. ½ N., and Gorino church steeple N.W. As the water shoals suddenly and the shoals are rapidly extending near the mouths of the Po delle Tolle, and from thence northward, care should be taken not to stand too far in. In case of necessity, vessels may anchor off any part of this coast; the holding ground is good.

**Po della Pila.—Maestra point** is at the eastern extreme of the delta of the Po; it is very low, the land in its vicinity being marshy, and divided by streams into a vast number of islands which frequently change their form, especially after heavy winter rains, and, in the spring, at the melting of the snows. There are, however, trees near it, close to the coast, which may be seen at a distance of 5 miles, and the white lighthouse somewhat farther. As previously stated, it is advisable to avoid closing the land in this neighbourhood within 4 miles, as depths of less than 3 fathoms extend 2½ miles off-shore, which depth is constantly growing out to the eastward along the front of the delta; the shallow bottom may be readily distinguished by day, in fine weather, by the discoloration of the water. A haze generally hangs over the coast, and it should be approached with great caution. Maestra point is 11½ miles northward of the parallel of Goro lighthouse, it projects but little beyond the general line of the beach, and the lighthouse stands on the low shore northward of the entrance of the Po della Pila. The Po della Pila has a charted depth of 4 feet in the entrance; it is subject to change.

Lat. 44° 59' N.  
Long. 12° 31' E.

**LIGHT.—Maestra point.**—From the lighthouse on Maestra point, a cylindrical white tower over three-storey yellow dwelling, 139 feet high, is exhibited at an elevation of 148 feet above the sea, a *white revolving* light, with a period of *one minute*, thus:—*Light, thirteen seconds*; *eclipse, forty-seven seconds*. The light is visible in clear weather from a distance of 18 miles; the eclipses are not total when within 10 miles.

Chart, 201 [793].  
Var. 9° 25' W.

**Fog signal.**—During thick or foggy weather, a steam siren gives one blast of *four seconds'* duration every *thirty-six seconds*. The siren is not sounded until about 1½ hours after the commencement of a fog; and will be heard only a short distance except under favourable conditions.

Lat. 45° 3' N.  
Long. 12° 25' E.

**The Po di Maestra** is the north-western branch of the Po; its mouth is about 5 miles north-westward of Maestra point, between which are two other small openings, Porto Parti Acque 1½ miles northward of the point, and port Palo within a mile of the Po di Maestra. Access to the Po di Maestra is extremely difficult, as the sandbanks frequently shift and the current is very rapid.

The channel is, in places, marked by piles, and the depth at the entrance is about 3 feet.

Contarina church steeple is a good distinguishing mark for this part of the coast; it is white, and bears W. ¼ S. distant 7¾ miles from the mouth of the Po di Maestra.

Lat. 45° 3' N.  
Long. 12° 23' E.

**Port Levante**, 1½ miles westward of the Po di Maestra, with a deep bight of very shallow water extending southward between them, is the mouth of the Po di Levante, which joins the Bianco canal; the latter leads to Adria and Astiglia, and communicates by channels with the Adige and Po Grande.

It has sufficient depth for very light craft only, and the sandbanks at its entrance, where there is but 3½ feet water, are subject to change. The village of Levante is on the southern side of the entrance to the river.

Port Caleri, 2¾ miles north-westward of Levante, is another small passage leading to the interior.

Chart, 201 [793].  
Plan, 1,483 [794].

**APPROACHES TO VENICE. — Lagoons. — General remarks.**—The coast between Maestra point and San Nicolo del Lido, a distance of about 30 miles following the coast line, is extremely low and intersected by marshes which render the neighbourhood very unhealthy in summer. The largest of these marshes form the lagoons of Venice and Grado. As far as Sottomarina battery, about a mile southward of the entrance of port Chioggia, the low sandy coast is bordered for a long distance off shore by shallow water with soundings gradually deepening towards the offing, and when northward of the Po di Maestra, it may be approached with prudence by the lead; southward of that river it should not be approached within 4 miles. When northward of the delta of the Po, and as far as San Nicolo del Lido, a depth of 5½ fathoms will be found at an average distance of 1½ miles from the shore.

\*Lat. 45° 1' N.  
Long. 12° 14' E.

The whole of this low coast is almost destitute of sea marks except the steeples of some of the more important villages, such as Contarina\* westward of the entrance of the Po di Maestra, Madonna di Marina chapel northward of port Brondolo; and, northward of this, Sottomarina village and the town of Chioggia, &c.

In the lagoon are numerous islets of varied and pleasant aspect, rising but little above the level of the water. These islets are about one hundred in number; twenty-five of them are inhabited and the city of Venice is built upon the largest of them, though this island itself is said to consist of no less than seventy-two islets or shoals connected with each other by the bridges of the city. The lakes or lagoons form a basin about 25 miles in length from north to south, which is separated from the sea by a long strip of land forming the Lido, a natural sea wall consolidated by artificial means and serving as a protection to the inner anchorages.

**Ports.**—There are six channels, called ports, leading to Venice, viz., Ports Brondolo, Chioggia, Malamocco, San Nicolo del Lido, St. Erasmo, and Tre Porti. The entrance to the two last is between the piers forming the new port of San Nicolo del Lido.\* All these lagoon ports are either the mouths of existing rivers or of former river beds.

Chart, 201 [793].  
Plan, 1,483 [794].  
Var. 9° 25' W.

\*Lat. 45° 26' N.  
Long. 12° 25' E.

**The navigation** of the lagoons and of the various channels between them is in a great measure carried on by towing and tracking; pilots are generally employed, and the winding passages are marked by piles. The flood stream enters with rapidity and speedily spreads over the scattered ponds and muddy morasses; so that, at high water, the scene is strangely changed, presenting one vast sheet of water which reaches from the islands on the coast to the mainland.

**Port Fossone** is at the mouth of the river Adige, one of the chief rivers of Italy, which rises in the Swiss Alps, traverses the Tyrol, passes by Trent and Verona, and reaches the sea about 4½ miles southward of Chioggia. It communicates with the lagoon ports and is navigable by boats as far as Verona, those of very light draught even ascending a short distance above Trent.

Lat. 45° 9' N.  
Long. 12° 20' E.  
Chart, 201 [793].

Port Fossone is fronted by sandbanks, and a channel through them into the river carries about 3 feet water. The depth about 1½ miles off the river entrance is from 5 to 6 fathoms; within 5 fathoms, the water shoals rapidly.

**Port Brondolo**, about 1½ miles northward of port Fossone, is at the mouth of the river Brenta, which rises in the mountains between Trent and Belluno and flows through a flat country from Bassano to the sea; it enters a navigable canal leading from Padua to Venice, and at Dolo trends southward and runs into the sea at Brondolo. The Brenta communicates by canals with Chioggia, Padua, Vicenza, the Adige, and the Po. Its mouth, like that of the Adige, is obstructed by the sandbanks which are common to both rivers. Port Brondolo, where several canals or streams meet, is 3 miles from the sea by the Brenta and nearly 1½ miles from the coast. When the river is swollen by rains, strong eddies are formed at the entrance.

The coast between Brondolo and the entrance of port Chioggia has nothing conspicuous but the steeple of the small Madonna di Marina chapel, and northward of this, Sottomarina village and the town of Chioggia.

**PORT CHIOGGIA** is at the embouchure of the Perognola channel, which is fed by the waters of the lagoons and several smaller channels, and reaches the sea between fort St. Felice on the south, and fort Caroman, on the southern end of Pelestrina island, on the north. This end of Pelestrina is bordered by a shoal, which reduces the channel into the port to a width of about 2 cables, though the forts are 4 cables apart.

Plan, 1,483 [794].  
Lat. 45° 14' N.  
Long. 12° 18' E.

**Depths.—Entrance.**—The shore bank or bar fronting and crossing the entrance to the port has about 2½ fathoms, and leads into a deep hole immediately northward of and almost touching fort St. Felice, where the depth in one place is as much as 13 fathoms; from thence, a narrow channel close along by the fort leads southward to the anchorage, which is well sheltered. The general depth in the port is from 1½ to 4½ fathoms, though in places along the southern shore it is considerably deeper. Vessels lie south-westward of fort St. Felice; but it is desirable when a long stay is intended to warp inside the Perognola canal, which is the real port of Chioggia.

Plan, 1,483 [794].  
Chart, 201 [793].  
Var. 9° 30' W.

With the exception of Malamocco, Chioggia has the advantage over all the other lagoon ports of a greater depth of water at its entrance, which, however, is often impracticable; a heavy sea is raised by north-easterly, south-easterly, or easterly winds, and the current is frequently strong; it is always advisable to take a pilot.

**Mooring buoys.**—South-westward of fort St. Felice, there are two iron mooring buoys, and light smaller buoys for torpedo boats.

**The town** is built on an island and contains about 29,000 inhabitants. It is traversed by a fine road and by a canal crossed by nine bridges; it contains several shipbuilding yards, and fishing is largely carried on. The various channels which meet at Chioggia and communicate with the Brenta, Malamocco, &c., are available for small coasting vessels only.

**Tides.**—It is high water, full and change, at Chioggia, at about 10h. 30m.; the rise is from  $2\frac{1}{4}$  to 4 feet at Malamocco.

Lat. 45° 14' N.  
Long. 12° 18' E.

**LIGHTS.—Fort St. Felice.**—In fort St. Felice, from an octagonal tower, 24 feet high, is exhibited, at an elevation of 52 feet above the sea, a *fixed white* light, visible in clear weather from a distance of 11 miles.

**San Domenico canal.**—From an iron standard on the Health office at the north entrance to San Domenico canal, a small *fixed red* light is exhibited, at an elevation of 25 feet above the sea, visible from a distance of one mile.

**Spoil buoy.**—There is a spoil buoy south-eastward of the entrance to Chioggia, in about 9 fathoms water, distant  $2\frac{2}{10}$  miles from fort St. Felice lighthouse

**Directions.**—Vessels bound to Chioggia should approach the low coast with caution, being guided by the lead. The high land in the vicinity of Padua is rarely visible, and the two objects which first present themselves are, generally, the steeple of Pelestrina, about 2 miles northward of the entrance, and that of Chioggia, which is high and surmounted by a vane. Southward of Chioggia, the steeples of Brondolo and Madonna di Marina chapel, and, on a near approach to Chioggia, the forts of St. Felice on the south, and Caroman on the north side of the entrance will be seen.

Vessels detained by contrary winds or waiting for the flood tide, anchor in a depth of 7 or 8 fathoms, mud and sand, off the entrance, about  $1\frac{3}{4}$  miles from the shore, with Pelestrina steeple bearing about N. by W.  $\frac{1}{4}$  W., and the steeple of Madonna church W.S.W.; but this anchorage cannot be recommended, except in fine weather or with off shore winds, as there is at other times a heavy sea. The lead should be kept constantly going by vessels approaching Chioggia.

**Coast.—Pelestrina island.**—Between Chioggia and port Malamocco, the lagoon is protected seaward by Pelestrina, a narrow sandy island, 6 miles in length, thickly peopled, and well cultivated. The part near Chioggia presents nothing remarkable, but northward of Pelestrina village, the church steeple of which is one of the most conspicuous on this coast, the island is covered with houses, and, at the northern part may be seen the tower of Porto Secco, the church of San Pietro in Volta, the new tower and fort of San Pietro at the entrance to Malamocco, and several batteries.

A high sea wall of limestone extends along the shore and protects the inner channels and anchorage. The sandbanks along the shore of Pelestrina are changeable in form and extent, and the shallow parts become wider as Malamocco is approached.

**Malamocco island**, known as Il Lido, extends N.E.  $\frac{1}{2}$  N. about 6½ miles in an almost direct line from port Malamocco to port San Nicolo del Lido. The northern portion is highest, and from this port to the Pilot tower (*see* page 86), near the south-western end, a sea wall protects the island from the heavy sea occasioned by southerly and easterly winds. The steeples of Malamocco and Poveglia at about 2½ and 2¾ miles from the south-western end of the island, the row of hotels facing the sea near fort Sta. Ma Elisabetta, the steeple of San Nicolo del Lido, 128 feet high, at the north-eastern end, the towers of Venice behind, the forts at the extremes of the island, the Pilot tower, and lighthouses, are the most conspicuous objects. *See* view on chart No. 201. Malamocco, like Pelestrina island, serves the lagoon channels as an effectual barrier against the violence of the sea.

Plan, 1,483 [794].  
Chart, 201 [793].  
Var. 9° 30' W.

**Peloroso road**.—This anchorage is off the entrance of port Malamocco in depths of 6½ to 8½ fathoms, mud, sand, and shells, from one to 2 miles from the lighthouse on the North mole-head. A fair summer berth for a large vessel is, in about 7 or 8 fathoms, with the pier-head light bearing W.  $\frac{3}{4}$  N., and Poveglia steeple a little open eastward of Malamocco steeple. A convenient berth is with the pier-head light bearing N.W. by W., distant one mile, in 7 fathoms.

Peloroso road is exposed to winds from between N.E. and S.E.; it is not advisable to anchor here in a large vessel, except in fine weather or to await high water for entering Malamocco; under other circumstances, it is better to proceed to Piave anchorage. Vessels should be quite prepared for a start when at anchor in this roadstead, which may be more easily quitted than other anchorages on the coast during bad weather.

**Spoil buoy**.—A spoil buoy, painted red, is moored in a depth of 10 fathoms, 3¼ miles S. 21° E. from the lighthouse on Malamocco North mole.

A wreck is charted about half a mile south-west of the spoil buoy.

**VENICE, Main channel**.—**PORT MALAMOCCHO**, by far the most important and most frequently visited of the lagoon ports, is the entrance to the only passage for large vessels to Venice, about 7 miles distant. Its central position also gives it an advantage, as sailing vessels overtaken by strong north-easterly or south-easterly winds, which are very dangerous on this coast, and unable to enter the port, can always, in case of necessity, either anchor in Peloroso road or seek shelter under the shore of Istria.

Lat. 45° 20' N.  
Long. 12° 20' E

**The port** is at the outlets of the Fisolo, Rocchetta, and Spignon channels, and has sufficient space for a number of vessels. One anchorage is on the southern side, in a depth of 5 or 6 fathoms, between San Pietro channel and San Pietro bastion, nearly 2 cables north-eastward of the latter. Another is more towards the north-western part of the port, in about 4 fathoms, at the mouth of the Spignon channel; and, in proceeding to it, vessels pass southward and westward of the beacons off fort Alberoni. A third anchorage is at the entrance to the Fisolo channel, northward of the Spignon.

**Depths.—Moles.**—**The entrance** to the port is between the moles which extend seaward from the shore abreast fort San Pietro on the south, and fort Alberoni on the north; like all the ports on this coast, it is obstructed by sandbanks, which, besides diminishing the anchorage space, render access difficult in a sailing-vessel unless with a fair wind and fine weather.

*See* view on chart  
201 [793].

Plan, 1,483 [794].  
Chart, 201 [793].  
Var. 9° 30' W.

The channel into the port with the leading marks on, carries 27 feet at low water, except at one part between the moles, W. by N., distant  $4\frac{1}{4}$  cables from the lighthouse on the North mole head, where a shoal about a cable in extent with a least depth of 19 feet has grown up; the passage southward and westward of this patch is about 80 yards wide in a depth of 27 feet; and, northward of it, 180 yards wide with from 27 to 28 feet water, the best channel and deepest water being towards the North mole. There is, however, only 25 feet water near the North mole, until about a cable's length within its head. Vessels drawing 28 feet can enter at high water.

The entrance is between the two piers or moles, the northern one projecting seaward in a S.E. by E.  $\frac{1}{2}$  E. direction upwards of a mile from the shore of fort Alberoni; the southern mole is shorter and its head bears W. by S.  $\frac{1}{2}$  S.  $3\frac{1}{4}$  cables from the North mole head, the width between them, when in the channel, being about  $2\frac{1}{4}$  cables. The stream, at times running 3 knots an hour between the moles, tends to scour the channel and keep it clear.

Vessels of war are not allowed to proceed to Venice without permission from the Port Admiral; *see* page 9. It is therefore convenient to make fast to one of the buoys at Malamocco, where pratique must be obtained, and where the powder must be discharged if a vessel is going to the arsenal.

**Directions.**—*See* page 90.

**Beacons.**—On the southern side of the harbour about one cable north-westward of San Pietro bastion are two beacons, and on the land on the western side of the entrance to the Rocchetta channel near Alberoni bastion are other two beacons; these are diamond-shaped, on poles, and painted red and white in opposite quarters. The four beacons when in line bear N. by E.  $\frac{3}{4}$  E. and S. by W.  $\frac{3}{4}$  W. from each other, and when bound to or from the Rocchetta channel, that line leads eastward of Alberoni spit, the shoal ground extending from the west entrance point. A beacon is charted about one cable within the extreme of this spit in about 3 fathoms.

**Buoys.**—There are four buoys for swinging ship, inside the short mole jutting out from the shore just westward of fort San Pietro; these buoys are also used as temporary berths.

Moorings for securing a first-class battleship are placed so that she lies parallel to the short mole, and about 100 feet from it.

**Coal.**—An average stock of about 20,000 tons is usually on hand at Venice. Steamers can coal either there or at Malamocco, the price free on board at the latter place being about 27s. per ton, and about two shillings less at Venice. Vessels coal in the stream from lighters, and about 400 tons per diem can be put on board. There is no coaling wharf for warships. *See* page 89.

**Semaphore.**—The semaphore and electric telegraph station is an isolated square building surmounted by a tower; it is about 80 feet above the sea and is called the Pilot tower. It is situated at Alberoni, nearly a mile from the southern end of Malamocco island, and is a remarkable object from seaward, being coloured with alternate black and white horizontal bands, and in that respect differing from the uniform Italian system; *see* page 9.

**Wireless telegraph.**—There is a wireless telegraph station on Malamocco island; *see* page 36.

**Tides.**—It is high water, full and change, at Malamocco, at 10 h. 30 m.; springs rise from  $2\frac{1}{4}$  to 4 feet. The stream enters by both the northern





and southern channels, meeting near Poveglia island. Their strength is very variable; in the Lido and Malamocco channels it runs at times at the rate of 3 knots. Plan, 1,483 [794].  
Chart, 201 [793].  
Var. 9° 30' W.

At Venice, it is high water, full and change, at 11 h. 15 m. A strong south-easterly wind, during a spring tide, causes an extraordinary rise and sometimes overflows the quays of the town.

The tidal steams off fort San Pietro are very strong; the ebb tide running south from Rocchetta channel meeting that running north from San Pietro channel forms strong eddies off the end of the short mole extending from the fort; great caution is necessary when passing this point, as there is a strong set towards the northern pier.

**LIGHTS.—North mole head.**—At the extreme of the North mole, at the entrance to Malamocco, is a white octagonal lighthouse, 34 feet high, from which is exhibited at an elevation of 41 feet above the sea, a *fixed and flashing* light, with a period of *fifteen* seconds, visible in clear weather from a distance of 10 miles, and showing as follows:—*White fixed, ten and seven-tenths seconds; eclipse, one and eight-tenths seconds; red flash, seven-tenths of a second; eclipse, one and eight-tenths seconds.*

**Fog signal.**—In thick or foggy weather, a steam siren gives three blasts every *fifty-two and a half seconds*, thus:—*Blast, two and a half seconds; silence, two and a half seconds; blast, two and a half seconds; silence, two and a half seconds; blast, two and a half seconds; interval, forty seconds.* The siren is not sounded until about one hour after the commencement of a fog.

**Rocchetta lighthouse**, on the curve of the sea wall on the northern side of the entrance and south-westward of Fort Alberoni, is an isolated white cylindrical tower over dwelling 76 feet high, from which is exhibited at an elevation of 81 feet above the sea, a *flashing white* light, with a period of *thirty seconds*, visible in clear weather from a distance of 15 miles, and showing thus:—*Flash, twelve seconds; eclipse, eighteen seconds.* Lat. 45° 20' N.  
Long. 12° 19' E.

**Spignon light.**—On the southern bank at the entrance to the Spignon channel, from a conical white lighthouse adjoining dwelling, 43 feet in height, and at an elevation of 49 feet above the sea, a *fixed green* light is exhibited visible from a distance of 7 miles.

Spignon *fixed green* light and Rocchetta *flashing white* light in line bearing N. 66° W., is a leading mark in mid-channel between the moles.

**Pilots.**—Government Regulations oblige vessels to take a pilot at Malamocco when bound to Venice or up any of the various channels. A pilot taken on board at the port or at sea is not allowed to pilot a vessel farther than the town of Malamocco, where another pilot for Venice must be employed and where he must be discharged on the vessel's way down.

**Quarantine station.**—The Quarantine station is situated in the channel to the west of Poveglia.

**Mooring buoys.**—At about 1½ miles north-east of the North molehead, with the lighthouse and the steeple of St. Pietro in Volta nearly in line, there are mooring buoys for the use of the Italian Navy.

**VENICE.**—The city of Venice is built on 72 islets or shoals, on foundations of piles and stone. It stands near the centre of a lagoon extending from Brondolo on the south to near Piave, a length of 30 miles by a breadth of 5 miles. The city is divided into two unequal portions by the *Canalazzo* or Grand canal, the course of which is north-west and Lat. 45° 26' N.  
Long. 12° 20' E.

Plan 1,483 [794].  
Chart, 201 [793].  
Var. 9° 30' W.

south-east, in the form of the letter S; it is further intersected by 146 smaller canals, termed *rii*, which are crossed by 306 bridges. Steamboats run every few minutes between Garden island at the south-eastern extreme of the city and the north-western end of the Grand canal, calling at various intermediate points. The small canals serve as streets, on which some 9,000 gondoliers or boatmen gain their livelihood.

Venice is the best built, and, next to Trieste, the most populous city in the Adriatic, and at the end of 1905, contained 155,746 inhabitants, including an average of about 10,000 temporary residents. It is connected with the mainland at Mestre by a railway viaduct 3,936 yards long; the railway station is in the north-western part of the city, on the northern side of the Grand canal. To facilitate communication with the mainland, there is a tramway line to and from Padua and Fusina, in connection with steamers plying regularly six times a day to and from Fusina and Venice. Other similar projects are in progress.

The pride of the Venetians is the Piazza di San Marco, distinguished by its stately edifices. The cathedral of San Marco is one of the finest in Europe; its historic and formerly conspicuous tower fell on 14th July 1902, previous to which it was a distinguishing mark to vessels making the port.

**Consulate.**—A British Consul is stationed at Venice.

**Hospital.**—There is a very fine civil hospital, available for foreign seamen at a small charge by Consular request.

**Meteorological Table.**—See page 379.

**Communication.**—Venice is in direct communication with Alexandria and the East by P. and O. steamers bi-monthly, calling at Ancona and Brindisi en route. With Trieste, thrice weekly by Austrian Lloyd's steamers. With Bari, Brindisi, Corfu, and Sicily, thrice weekly by the Italian Steam Navigation Company's steamers.

**Trade.**—The principal imports are sugar, coffee, indigo, wine and spirits, silk, woollen and cotton yarn and goods, grain, coal, hides, metals, oils, &c. The exports are glass wares, silk, hemp, wax, &c. The total value of the imports, in 1905, was 15,268,771/., and of the exports 13,215,920/.

In the same year, 1,407 steam vessels with a total of 1,607,716 tons entered the port, as also 1,936 sailing vessels of 113,814 aggregate tonnage.

**DOCKS.**—There is a Naval arsenal with two Government graving docks at Venice, and a tidal basin at the eastern end of the city; the docks are of the following dimensions:—

No. 1 dock is 524 feet in length over all, 80 feet wide at entrance, and has 25½ feet over the sill at high water.

No. 2 dock is 295 feet in length, 59 feet in breadth at the entrance, and has 19½ feet over the sill at high water.

At the Government dockyard there is a hydraulic crane capable of lifting 156 tons, and another of 30 tons for masting, &c. There are three steam hammers, but only small engines, boat machinery, &c., are manufactured here, this being mainly a building yard and the engines and boilers being supplied by private firms.

There is also a floating dock, 365 feet in length over all, 61 feet in breadth, with a depth of 22 feet on the blocks, and lifting power of 4,500 tons. This dock is the property of the Company "Cantieri Liguri-Anconitani," and is situated in the Giudecca channel.

**Repairs.**—The firm of E. G. Neville & Co. can effect repairs to hull or machinery; they have a 40-ton crane, steam hammer, turning

lathes, &c., and can make iron masts of any size, build and fit steam launches, &c.

Plan 1,483 [794].  
Chart, 201 [793].  
Var. 9° 30' W.

**Supplies.**—Water of good quality may be procured from the Water-works Company. Water is obtained from the springs of St. Ambrozio Treviso. Rain water is preserved in cisterns and recourse is also had to the river Brenta. Several artesian wells are sunk in the town; water is also brought in from the river Sile by pipes along the railway viaduct. Vessels of war are usually accommodated with a Government tank vessel on application to the naval authorities.

Supplies of all kinds are plentiful and good.

**Coal.**—Vessels of war are recommended to wire beforehand, if possible, their coal requirements and probable date of arrival, in order that permission may be obtained to freely enter Malomocco harbour, and thence proceed to the canal of San Marco. See page 86 for coal supply, &c.

**TIME SIGNAL.**—A time ball (red) is hoisted two minutes before signal, and dropped at the Observatory, Patriacale, Seminario di Venezia, Venice, at noon mid-European time, corresponding to 23h. 0m. 0s., meantime at Greenwich. A gun is also fired at the same time.

Lat. 45° 25' 50" N.  
Long. 12° 20' 11" E.

The signal is made by means of a chronometer compared by telegraph with the Observatory of the Hydrographic Office.

**Storm signals** are hoisted at a flagstaff (12 feet above the sea) on the extreme of the mole northward of San Giorgio island, and indicate as follows:—

1. A black drum - - - Probable succession of sudden gales from various quarters.
2. A black cone, apex upwards - Probable sudden gale from the north.
3. A black cone, apex downwards - - - Probable sudden gale from the south.
4. A black cone, apex upwards, over a black drum - - Probable storm from the north.
5. A black drum over a black cone, apex downwards - Probable storm from the south.

The signals can be seen only by vessels lying in the basin of San Marco and in part of the Giudecca channel.

**Current signals.**—From the Flagship of the Admiral stationed at Venice, the following signals are made with reference to the tidal movement:—

- A ball at the signal yard - - Indicates that the tidal stream is running in.
- A cone at the signal yard - Indicates that the stream is running out.
- The ball or cone hoisted close up Indicates that the stream is at its maximum strength.
- The ball or cone hoisted half-way up. Indicates that the stream is running at a moderate rate.
- The ball or cone quite low down Indicates that there is slack water.

**Pilots** are obtainable here for the Lido entrance as well as for Malamocco, see page 87.

**MALAMOCCHO to VENICE.—Depths.**—The Malamocco entrance, the main approach to Venice, is available at high water for vessels of 28 feet draught, but a pilot should be employed for vessels of heavy draught.

Plan 1,483 [794].  
Chart, 201 [793].  
Var. 9° 30' W.

Lat. 45° 20' N.  
Long. 12° 21' E.

In 1904, the Rocchetta, Malamocco, San Spirito, and Orfano channels carried a depth of 30 feet all the way up to Venice except for about a quarter of a mile at the southern end of the Rocchetta channel, opposite the harbour master's office, where there is 27½ feet. Dredging is still going on. The San Marco channel has from 22 to 30 feet.

**Directions.**—In making Malamocco in hazy weather, the entrance is rarely first seen as the Rocchetta and North mole lighthouses are then not easily made out. In clear weather, in approaching the coast by day, the buildings of Venice may be seen. To the northward the most conspicuous object is the Pilot tower attached to a square building and painted in black and white horizontal stripes (*see* page 86); to the westward, about two cables distant from the tower, is a conspicuous quoin-shaped clump of trees and bushes; these objects are generally made out first. To the southward are the churches of San Pietro and Porto Secco with short belfries, the former being the larger and more noticeable.

On nearer approach, the tall campaniles of Malamocco (108 feet) and Poveglia (124 feet) show up to the northward, and then gradually the entrance with the lighthouses and the large low forts of San Pietro and Alberoni, with shipping (a battleship in the reserve is generally inside).

To enter between the moles, steer in with Spignon and Rocchetta lighthouses in line, bearing N. 66° W., which leads into the harbour through the fairway in not less than 19 feet. A vessel of deep draught, having entered on the above mark, should, when about one cable distant within the North mole light, open the marks by edging towards the north mole, to pass between the mole and the 19-foot patch situated W. by N. 4¼ cables from the North mole head, in not less than 27 feet at low water, thence in mid-channel. In extraordinary low tides there may be a foot less water than here given. When within the small mole projecting northward from the western angle of fort San Pietro, edge to the southward for the anchorage or to pick up one of the mooring buoys.

If entering the Rocchetta channel, the beacons on either northern or southern shore in line will lead eastward of Alberoni spit, but the set of the tide should be carefully watched in turning into this channel. From thence, the Rocchetta, Malamocco, San Spirito, and Orfano channels, the whole of the way to the city are marked by clusters of piles, which serve to support the banks and preserve the channel.

After turning into Rocchetta channel, the navigation of vessels drawing 26 feet and up to 350 feet in length, is not considered difficult. Vessels cannot pass one another and caution is required when passing the openings of any of the smaller channels, especially during spring tides. The deep water channel is not very broad and the best water is to be found towards the eastern side all the way up. The narrowest part of the channel is off San Clemente, where it would be most dangerous for steamboats to pass or overtake steam vessels, since the water becomes piled up against the ship's side and rushes with great force along it and towards the stakes on the banks.

Owing to the very strong currents at spring tides vessels of very heavy draught are preferably navigated at neap tides, there being only a difference of about 1½ feet.

**At night.**—The lights are available for entering, substituting light for lighthouse in the preceding directions, but it is not recommended that vessels of other than light draught should enter without a pilot.

**Sailing vessels.**—If off port Malamocco in the evening and not intending to enter, and if the breeze is too fresh for anchoring, it is advisable

in a sailing vessel to keep 10 or 12 miles to the eastward under easy sail, taking care when standing in not to allow the vessel to be set too near **Maestra** point by the south-westerly current. Time of tide and draught of water must be considered in entering this port, especially if proceeding to Venice. It is not prudent for a sailing vessel to enter with strong north-easterly or south-easterly winds.

Chart, 201 [793].  
Plan, 1,483 [794].  
Var. 9° 30' W.

**Anchorage.**—The following are berths for battleships at Venice:—  
Off the public gardens, at low water, a vessel of this class would have her inner bilge resting on soft mud in  $25\frac{1}{2}$  feet water. Opposite San Giorgio and abreast the monument, on the north side of the channel, with 25 feet at low water on inner side of ship. Off the custom house opposite San Marco square, in 28 feet water; this is the best berth.

Lat.  $45^{\circ} 26' N$ .  
Long.  $12^{\circ} 21' E$ .

Vessels lay parallel to the bank, at their own anchors, stern secured to buoy. There is no danger lying at these berths, and by dropping the anchors a little farther out than is usually done, deeper water is found, but this rather interferes with the fairway and is only done on special occasions.

Small vessels of war are permitted to moor head and stern to buoys off Garden island in the San Marco channel, or farther up, to a buoy off San Marco square, with the stream anchor astern to prevent swinging with the stream.

**Arsenal.**—The military port or arsenal takes in the Maraffi channel from St. Elena; all explosives have to be discharged before going in; this condition does not apply to other parts of the anchorage at Venice. The shallow ground to the southward of St. Elena is being dredged.

**Wireless telegraph.**—A wireless telegraph station is installed at the Venice arsenal; see page 36.

**OFFING BANK.**—**Cortellazzo bank.**—This extensive bank of gravel and weeds extends in an E.N.E. and W.S.W. direction between port Malamocco and the town of Caorle at from 7 to 12 miles from the coast. The bank is but a slight elevation of the bottom about a mile wide, extending 25 miles parallel with the shore and having depths of from 10 to 12 fathoms; within the bank, the depth is from 10 to 13 fathoms, and outside it, from 13 to 15 fathoms, sand. It is said to afford some protection from the sea to the anchorages on the coast.

Lat.  $45^{\circ} 20' N$ .  
Long.  $12^{\circ} 45' E$ .  
Chart, 201 [793].

**Spoil buoy.**—A red cylindrical spoil buoy, surmounted by a ball, is moored in 8 fathoms water,  $4\frac{7}{10}$  miles N.  $65^{\circ} E$ . from the lighthouse on Malamocco North mole, and  $2\frac{1}{2}$  miles S.  $\frac{1}{2} E$ . from the entrance to port Lido.

**PORT SAN NICOLO DEL LIDO** is at the northern end of Il Lido or Malamocco island. It was formerly, and probably will be again, the chief port of the lagoons, but at present the depth in its entrance is 21 feet at low water, the deepest channel being on the port hand going in. Improvements are in progress.

Lat.  $45^{\circ} 26' N$ .  
Long.  $12^{\circ} 25' E$ .  
Plan, 1,483 [794].

**Breakwaters.**—The entrance to the port is formed by two breakwaters, the northern of which extends from the shore at Sabbioni point in a south-westerly direction, and curving gradually seaward until the outer part takes a south-easterly direction, the total length being  $2\frac{1}{4}$  miles. The southern breakwater extends from the old mole at fort San Nicolo in a south-easterly direction  $1\frac{1}{2}$  miles. The entrance between them is half a mile wide.

Plan, 1,483 [794].  
Chart, 201 [793].  
Var. 9° 30' W.

**Depths.**—During high water, with no swell on vessels of 20 feet draught can proceed through the channel leading to Port Lido, between the breakwaters. This channel is situated a short distance from the western breakwater, and care is necessary in approaching it from seaward, as the entrance is only about  $1\frac{1}{2}$  cables in width, between the shoals, formed by detritus, near the breakwaters.

The distance from San Nicolo point to Venice arsenal is  $1\frac{1}{2}$  miles by the channel, which is deep throughout, the shoalest part south-eastward of La Certosa having 23 feet. The depth along the shore of Malamocco island within the port and close to fort San Nicolo, is 6 and 7 fathoms, sandy bottom; here it is customary for vessels after dropping an anchor, to lay out a cable to the south-eastern shore.

Dredging is in progress (1908) in port Lido entrance, and in Giudecca channel; to be deepened to 28 feet.

Lat. 45° 25' N.  
Long. 12° 26' E.

**BUOYS.**—**Light buoys.**—An iron conical light buoy, painted red, from which is exhibited a *flashing green* light, visible about 5 miles, is moored off the end of the northern breakwater. A similar buoy, painted black, with *flashing red* light, is placed off the end of the southern breakwater.

**Channel buoys.**—Two conical buoys, painted red with black tops, are moored on the north side of the channel between the breakwaters. The shoal extending from the semaphore, south side of the entrance to the lagoon, is marked by three buoys, painted in black and white stripes, and by groups of stakes. There are a number of buoys marking the inside channels, for which *see* plan, No. 1483.

**Semaphore.**—There is a semaphore on the north-east extremity of fort San Nicolo painted in black and white squares; attendance at this station is not continuous; *see* page 9.

**Tides.**—It is high water, full and change, in port Malamocco about 10 h. 30 m., rise  $2\frac{1}{2}$  to 4 feet. The tide enters by both the northern and southern passes, the streams meeting near Poveglia island, a strong south-east wind during a spring tide causes an extraordinary rise, which at times overflows the quays of the town. The strength of the current is variable in the channels and sometimes attains a rate of 3 knots (*see* pages 86 and 89).

**Pilots** for the Lido channel can be obtained at Malamocco; *see* page 87.

### Regulations for entering:—

- (a.) The speed of vessels between the gas buoys at the entrance and the Harbour office, Lido, is not to exceed the rate of 5 knots an hour.
- (b.) When nearing any barges alongside the moles the speed is to be reduced to a minimum.

Captains of vessels infringing the above rules are liable for the damage done as well as for the penalties incurred by breaking the Port Regulations.

**Port St. Erasmo**, the entrance to which is so obstructed by the sandbank of port San Nicolo del Lido, that it is only practicable for boats or vessels of very light draught, in fine weather and at high water. The entrance is 6 cables eastward of fort San Nicolo. St. Erasmo island is well cultivated.

**Tre Porti** channel runs up in a north-easterly direction towards the channels and lagoons at its head, and leads directly to Burano, and

Lat. 45° 27' N.  
Long. 12° 23' E.

from thence communicates by canals with Caorle and Venice, and other places in the interior. The passage in is between the northern breakwater of the entrance to port San Nicolo del Lido and the shoal extending from St. Erasmo on the west; a depth of about  $1\frac{1}{4}$  fathoms can be carried over the flat in its entrance, and within it the depths range from  $1\frac{1}{4}$  to 3 or 4 fathoms. Plan, 1,413 [794].  
Var.  $9^{\circ} 20'$  W.

**OFFING.—Anchorage.**—Vessels may anchor in a depth of from 7 to 9 fathoms, about  $2\frac{1}{2}$  miles from the shore, anywhere along the coast between port Lido and Piave Vecchia. Small vessels anchor nearer the shore in about 4 fathoms, sand, mud, and shells. Chart, 201 [793].

The best anchorage is about 8 miles eastward of fort San Nicolo del Lido church and about  $2\frac{1}{2}$  miles from the shore; the depth is 9 fathoms, sand and mud. Here, Piave point gives some shelter in a Bora; and this is a good anchorage with northerly or westerly winds, but bad with south-easterly and south-westerly winds which send in a considerable swell, and then Peloroso anchorage is to be preferred. Easterly and south-easterly winds, however, with good ground tackle, need not be feared in case of necessity, though it would always be advisable, if the weather should look threatening from the eastward, to weigh and seek shelter under the coast of Istria.

In approaching the anchorage from the north-eastward in clear weather after making the land eastward of Venice, a vessel should be guided by San Nicolo church tower (128 feet high), and by Piave Vecchia lighthouse, bearings of which will indicate a vessel's approach to the shore.

**COAST.—Port Piave Vecchia** is 7 miles eastward of port Lido. The coast between consists of sandhills; small boats have no difficulty in landing during fine weather. The port is a winding channel about 60 yards wide, and, extending inland, communicates with other channels. Vessels drawing 7 feet can enter at high water with local knowledge. Lat.  $45^{\circ} 28'$  N.  
Long.  $12^{\circ} 35'$  E.

It is the ancient mouth of the Piave and receives the waters of the river Sile which has a depth of 10 feet as far as Treviso, about 20 miles from the sea. Vessels anchor in any part of the channel and secure to the shore against the freshets from the Sile. The Piave rises at the foot of mount Paralba and is navigable from the sea, at port Piave Vecchia by small craft, up to the village of Noventa about 14 miles.

The entrance to Piave Vecchia may be recognized by the conspicuous lighthouse.

**LIGHT.**—On the western entrance point of the Piave Vecchia is a circular white tower, 136 feet in height, from which is exhibited at an elevation of 146 feet above the sea, a *fixed white* light, visible in clear weather from a distance of 18 miles. The lighthouse is also a telegraph station; *see* view on chart. Lat.  $45^{\circ} 32'$  N.  
Long.  $12^{\circ} 45'$  E.

**Port Cortellazzo**, about  $7\frac{1}{2}$  miles eastward of Piave Vecchia, is the mouth of the river Piave which communicates with Caorle and the lagoons by various channels, navigated by vessels of about 3 or 4 feet draught. The entrance is obstructed by sandbanks on either side; between them is a narrow channel, with a depth of about 3 feet at low water; at high water, when no leading marks can be distinguished, the entrance is more difficult. It can only be entered by those locally acquainted.

The position of this little port may be known by its being nearly midway between the lighthouse of Piave Vecchia and Caorle church steeple.

Chart. 201 [793].  
Var. 9° 20' W.

**The anchorage** off the port is in a depth of about 8 fathoms, mud and sand. Vessels may anchor anywhere about 2 miles from the shore between Piave Vecchia and Caorle.

**The coast** between Cortellazzo and Caorle, 7 miles farther eastward, consists of sandhills scarcely above the level of the sea. Under favourable circumstances, it may be approached by the lead; but, in winter, it is advisable for sailing vessels to give it a wide berth, as south-easterly winds, which are of long duration, blow right on it.

Lat. 45° 35' N.  
Long. 12° 52' E.

**Port Santa Margherita** is the mouth of the Livenza river which is fed by the waters from the Friuli mountains and communicates with Venice, Treviso, &c. The entrance, about a cable wide, with a depth of little more than 3 feet at low water, is over the flat which fronts the shore. The stream of the river and strong south-easterly winds occasionally alter the direction of the channel.

The small craft which visit this little port anchor offshore in from one to 2 fathoms, muddy bottom.

**Caorle.**—This town is on the sea shore, about a mile north-eastward from Santa Margherita, and its church steeple (light), 162 feet high, is the only conspicuous object on this coast; though, when near the land, some large buildings may be seen about 2 miles north-eastward of it. A stone embankment protects the shore abreast of the town, and on a projecting point north-eastward of it, is the church of Madonna degli Angeli. Water and small supplies of provisions of all kinds are obtainable at Caorle.

**LIGHT.**—A *fixed white* light, elevated 41 feet above the sea, and visible in clear weather from a distance of 10 miles, is exhibited from the steeple of Caorle church situated at the extremity of the point eastward of the town.

**Grado lagoons**, also known as the Marano lagoons, commence at Caorle; they resemble those of Venice and embrace an extent of 30 miles from east to west; most of the twenty-five islands, of which the chief is Grado, have but few inhabitants.

Lat. 45° 37' N.  
Long. 12° 55' E.

**Port Falconera** is at the mouth of the river Lemene. The port runs in for about  $1\frac{1}{2}$  miles and has from about 8 feet water at the entrance to an average of 4 fathoms within, but the bed of the river is very uneven, and in places there are depths of 7 and 8 fathoms. The port affords shelter from all winds for a large number of vessels of the size capable of entering. It is convenient for loading and unloading, and the holding ground is good. The passage in is marked by stakes on either side, and there are two openings through them; one, close eastward of Caorle with 6 feet water; the other, about a mile north-eastward of Caorle, over the flat, which apparently has less water; the former is more frequently used.

The port has water communication with Portogruaro, the Livenza, Caorle, Venice, Treviso, &c.

**The coast** between ports Falconera and Baseleghe, 3 miles farther north-eastward, is a low sandy shore bordered by shallow water for a distance of three-quarters of a mile seaward, parts of which are nearly dry at low water. Vessels may anchor in a depth of about 5 fathoms, good holding ground, at  $1\frac{1}{2}$  miles from the shore, for temporary shelter from a westerly

No. 472.—PORT FALCONERA—ALTERATION IN CHARACTER OF LIGHT  
ON WEST SIDE OF ENTRANCE.

*Position.*—West side of entrance.

Lat.  $45^{\circ} 37' N.$ , long.  $12^{\circ} 54\frac{1}{2}' E.$

*New abridged description.*—Lt. Fl., Red, ev. 5 sec., vis. 6 m.

*Alteration.*—The fixed red light has been replaced by a flashing red light  
every five seconds, thus:—

<u>Flash,</u>	<u>eclipse.</u>
---------------	-----------------

1 sec.	4 secs.
--------	---------

*Remarks.*—The visibility of the new light is 6 miles.

Chart No. 201.

Med. 3, p. 94.



gale or from heavy northerly or north-easterly winds; but with onshore winds, this anchorage is not recommended. Chart. 201 [793].  
Var. 9' 10' W.

The entrance to the small port of Baseleghe is barred by a sandbank, which at times is nearly awash, and is only accessible to boats in fine weather and at high water. Caorle church steeple to the westward is a guide to the position of this place.

The coast between Baseleghe and the mouth of the Tagliamento river,  $4\frac{1}{2}$  miles eastward, consists of low sandhills, and forms a point projecting considerably near where that river flows into the sea; a few scattered trees alone breaks the uniformity of the view. Between the Tagliamento river and Lignano,  $3\frac{1}{2}$  miles farther north-eastward, the coast falls back, forming a bay completely exposed to south-easterly winds; it is very low, and bordered by shoals which render access difficult even for boats. Vessels sometimes anchor temporarily about 2 miles from the shore, in a depth of  $5\frac{1}{2}$  fathoms, clay bottom.

**Tagliamento point and river.**—The river Tagliamento communicates with Latisana, 9 miles northward of its mouth, and is navigable by boats for about 13 miles. The entrance between two shifting sandbanks, is only a few fathoms wide and is nearly dry at low water. The position may be recognised by Caorle and Marano church steeples, the latter a low square tower N.N.E.  $\frac{1}{2}$  E. nearly 8 miles from the entrance, and by the low projecting point of Tagliamento, which is considered the western boundary of the gulf of Trieste on this shore.

**PORT LIGNANO** is at the entrance of the river Stella; it runs in upwards of a mile with an average breadth of 3 cables, and being from 20 to 25 feet deep, with a little under 10 feet in the entrance channel, is the best and most useful port on the Friuli coast. It communicates by channels with Marano and Muzzano, and, by the Stella with Palazzolo.

The best berth in the port is off the mouth of the Marano channel, where vessels moor with open hawse to the southward and are completely sheltered.

The entrance to the port, about  $2\frac{1}{2}$  cables wide, is fronted by an extensive shallow bank which extends southward  $1\frac{1}{2}$  miles from the Custom-house, with passages through it for small vessels. Those unable to stem the ebb tide, which after heavy rains is rapid, usually anchor at the entrance, opposite the buildings and old battery on the port hand, but the anchorage here is exposed to winds from seaward.

The port may be recognised by a remarkably large pine tree at Pineda westward of the entrance, by the Custom-house at Lignano, and a conspicuous two-storied house, painted red, on the western side of the entrance, by the Custom-house of St. Andrea, and by the low tower of Marano. The deeply serrated outline of the Friuli mountains will be seen in the background. The low coast in the neighbourhood of Lignano should be cautiously approached by the lead, and not within the distance of about 2 miles unless the entrance is seen.

**LIGHT.**—A *fixed white* light, elevated 19 feet above the sea, and visible in clear weather from a distance of 5 miles, when bearing from N.  $9^{\circ}$  E., through north and west, to S.  $51^{\circ}$  E., is exhibited near the Custom-house.

**Buoys.**—The entrance to the port is indicated by a conical buoy with staff and cylinder, painted red and marked No. 1, situated on the west side of the channel nearly a mile S. by E.  $\frac{1}{2}$  E. from the Custom-house.

Chart, 201 [793].  
Var. 9° 10' W.

Four other conical buoys, painted red and marked Nos. 2, 3, 4 and 5, from the west, respectively, show the fishery limit.

**Directions.**—For entering the port, a pilot or local knowledge is required. It is imprudent to attempt to work into Lignano against a fresh breeze and ebb tide; a vessel should then anchor about 2 miles from the entrance, in a depth of  $5\frac{1}{2}$  or 6 fathoms, good holding ground, with Marano steeple bearing about N.  $\frac{1}{2}$  E.; and Tagliamento point W. by S.  $\frac{1}{2}$  S.

Chart, 1,434 [795].  
Lat. 45° 42' N.  
Long. 13° 12' E.

**Port St. Andrea.**—The small harbour of St. Andrea is about a mile eastward of the entrance to Lignano, from which it is separated by an extensive shallow named the Martignano bank. About 6 feet water may be carried through the entrance.

Chart, 201 [793].

**COAST.**—Between Tagliamento point and port Grado, 11 miles apart, the low coast consisting of sand hills, forms a bay receding nearly 4 miles, with a depth of about 5 fathoms at the distance of 2 miles off. About midway is port Buso, the frontier port between Italy and Austria; it is low, and shallow water, 3 fathoms and less, extends about one mile off.

---

General chart 1,440 [789].

## CHAPTER IV.

## PORT BUSO TO MERLERA POINT.

THE eastern shore of the Adriatic, from port Buso, at the boundary between Italy and Austria, to cape Linguetta, embraces an extent of about 570 miles. The portion described in this chapter is that contained between port Buso, and Merlera point on the southern coast of Istria. Charts, 201 [793].  
1,434 [795].  
Var. 9° 5' W.

**Coast.**—The Friuli coast extending from Buso eastward to Trieste, forms the head of the gulf of Trieste; its aspect, which on the west is low and sandy, changes completely at Duino on the north-eastern side of Panzano bay, becoming high and precipitous. From Buso the shore trends south-eastward 6 miles to the town of Grado, and then eastward  $8\frac{1}{2}$  miles farther to Sdobba point; it is all very low and broken, the only remarkable object being Grado steeple. Sandbanks and shallow water, bordering the coast, extend nearly 2 miles off shore in places, and render approach difficult except in small craft by those locally acquainted.

The most extensive banks on this part of the coast are the Orio bank between ports Buso and Grado, and the Mula di Muggia, eastward of Grado, which dries  $1\frac{1}{2}$  miles out at low water, leaving between its north-eastern end and the shore bank, a passage into the small area of port Primero.

**Port Buso.**—This port communicates with all the lakes and receives the waters of the Anfora, Ausa, and Indermur rivers, but is only suitable for small coasters. The channel in between the banks has a depth of 6 to 8 feet, which increases to 4 fathoms within; the banks on which there is less than 6 feet water extend three-quarters of a mile from the shore. Boats ascend the river Ausa as far as Cervignano village, a distance of about 10 miles. Lat. 45° 43' N.  
Long. 13° 15' E.

The position of the entrance is indicated by Marano steeple to the north-west, and by that of Grado on the south-east. Entering Buso the red piles should be left on the starboard hand and the black piles on the port hand.

**LIGHT.**—A *fixed* harbour light, elevated 11 feet above the sea, is exhibited from a post at the head of the landing stage at port Buso visible, in clear weather, from a distance of 3 miles; it shows *white* when bearing from N. 31° W. to N. 12° E.; *red* from N. 12° E. to N. 27° E.; *white*, from N. 27° E., through east, to S. 9° W.; obscured elsewhere.

**Anfora.**—The small port of Anfora is only separated from port Buso by a sandbank which uncovers at low water and extends  $1\frac{1}{2}$  miles eastward from the point on which stands a fort. There is a depth of about 3 feet only at the entrance of this port, and 16 feet, mud, within.

**Port Grado** communicates by water with Buso, Marano, and Aquilea; it is formed by openings through the banks and by the waters of the lagoons which surround the village of Grado. The Orio bank on the west, and the banks fronting the port, extend upwards of a mile off shore, Lat. 45° 40' N.  
Long. 13° 22' E.

Chart, 1,434 [795].  
Var.  $9^{\circ} 5' W.$

and a passage through dredged to a depth of 13 feet, leads in to a depth of  $5\frac{1}{2}$  fathoms, mud and clay bottom. The banks are affected by freshets from the lagoons, and by strong winds from seaward.\*

The population of Grado may be about 4,000, largely engaged in the tunny fishery. Entering port Grado the red beacons should be left on the starboard, and the black beacons on the port hand.

**Telegraph cable.**—A telegraph cable runs between Grado and Cittanuova, on the coast of Istria.

**LIGHTS.**—On the east side of the entrance to port Grado, a *fixed red* light (unwatched) is exhibited, at an elevation of 24 feet above the sea, from a red iron framework-structure, in a depth of 10 feet water; it is visible in clear weather from a distance of 6 miles.

**Harbour lights.**—Two small *fixed white* harbour lights are shown within the port from lamp posts; they are elevated 16 feet above the sea, and are visible 3 miles. One of these lights is situated at the head of the embankment on the west side of the entrance to the port, the other is on the mole inside; these lights in line correspond with the direction of the channel, and form leading lights.

**Mula di Muggia bank.**—This bank, within the 3-fathoms line, extends  $1\frac{3}{4}$  miles from the shore between ports Grado and Primero and dries for over a mile of that distance; the bank is reported to be extending in a south-west direction. Vessels should be cautious in approaching it and keep the lead going, especially in thick or hazy weather.

**LIGHT.**—In about 10 feet water on the south extreme of Mula di Muggia bank with Barbara church bearing N.  $4^{\circ} W.$ , distant  $2\frac{9}{10}$  miles, stands an iron framework structure 28 feet high, from which is exhibited, at an elevation of 23 feet above the sea, a *fixed white* light (unwatched), visible in clear weather from a distance of 7 miles.

**Port Primero** lies  $3\frac{3}{4}$  miles eastward of Grado; the entrance is through shallow openings in the sandbanks by which it is surrounded, but within, the water is deeper, being 3 fathoms. The objects by which the position of port Primero may be recognised are, Grado steeple, and a tower near the shore half a mile to the right of the entrance.

Vessels entering port Primero should leave the red piles on the starboard hand, and the black piles to port; the outermost piles are surmounted by a cross.

**Sdobba point and port.**—At about 4 miles eastward of port Primero, and immediately westward of Sdobba point, is the embouchure of the Isonzo and Isonzato rivers, named port Sdobba, which communicates by the inland waters with Primero. Its entrance has less than 3 feet water, and like the whole of this coast it is encumbered by sandbanks, which, by frequent changes, alter the depth and breadth of the passage. Fine weather is required for boats entering port Sdobba, as the approach is dangerous when there is the least break on the shoals.

Sdobba point is low, projecting a long way eastward, and is surrounded by shallow water extending more than a mile off shore; it is easily recognised, being the eastern extreme of this part of the coast and forming the south-western point of Panzano bay. Aquilea steeple may be seen  $2\frac{1}{2}$  miles north-westward of it, and the village of Monfalcone on an eminence  $5\frac{1}{2}$  miles to the northward.

\* According to Austrian writers, Richard Cœur de Lion was wrecked on a small bank near Aquilea: it was undoubtedly on the shoals of Grado.—Captain W. H. Smyth, R.N.  
General chart, 201 [793].

Lat.  $45^{\circ} 39' N.$   
Long.  $13^{\circ} 26' E.$

Lat.  $45^{\circ} 43' N.$   
Long.  $13^{\circ} 35' E.$

**PANZANO BAY**, or Sacca di Panzano, recedes about 3 miles in a north-westerly direction from a line drawn between Sdobba point and Duino; it has a depth of  $5\frac{1}{2}$  fathoms decreasing towards the shore all round, muddy bottom. The shore on the western side and at the head of the bay is very low and rendered inaccessible by sandbanks and shallow water to other than small craft; on the north-eastern shore high land commences, and about Duino the depth of 4 or  $4\frac{1}{2}$  fathoms is found close inshore.

Chart, 1,434 [795].  
Lat.  $45^{\circ} 45' N.$   
Long.  $13^{\circ} 34' E.$   
Var.  $9^{\circ} W.$

Several streams run into the bay, of which the small opening named port Rosega, a little channel between two piers with 4 feet water, and the river Timavo are the chief.

Works are in progress (1905) for deepening the present channel leading to port Rosega to a depth of 13 feet; also to form a new channel from the sea to be continued to Monfalcone, in which the depth will eventually be  $18\frac{1}{2}$  feet.

There is anchorage in a depth of 5 or  $5\frac{1}{2}$  fathoms, mud, in the central part of Panzano bay.

**Light.**—On the East mole head of port Rosega, a *fixed green* light, elevated 18 feet above the sea, is exhibited from an iron lamp post; it is visible in clear weather from a distance of 2 miles.

**Timavo river.**—The mouth of this river is  $1\frac{1}{2}$  miles south-eastward of Rosega and under a steep rocky eminence, on the summit of which is Duino castle. It is well sheltered from all but southerly and south-westerly winds, which raise a considerable swell. It is through this river, which is very shallow in the entrance, that Venice and the whole of Friuli are largely supplied with grain exported from Trieste.

The river Timavo flows into the sea through an extensive shifting sand-bank, about 3 miles N.N.E. from Sdobba point. The entrance is between this bank and the shore, and parallel with the latter. The depth at the outer part is 3 feet, but it increases within to 9 feet, sand and mud. The position of the entrance is easily recognised, being opposite a walled inclosure on a hill a small distance inland and about half a mile north-westward of Duino village.

**Port Duino.**—The village and castle of Duino stand on a rocky height at the foot of which is the port, a little creek protected by a short mole; the depth at the entrance is 15 feet, with about 3 feet, muddy bottom, within. South-westerly winds cause a swell inside.

Lat.  $45^{\circ} 46' N.$   
Long.  $13^{\circ} 36' E.$

**Light.**—A *fixed* light, elevated 12 feet above the sea, is exhibited from an iron standard on the west side of the entrance to port Duino, showing *white* when bearing from N.  $81^{\circ} E.$ , through north, to S.  $81^{\circ} W.$ ; *red* elsewhere. The *white* light is visible in clear weather from a distance of 5 miles, *red* light at 3 miles. This light is a guide at night to both port Duino and of the entrance to the river Timavo.

**Lifeboat.**—A lifeboat is stationed at Duino.

**THE COAST** between Duino and Trieste, an extent of about 9 miles, trends in a south-easterly direction and forms the head of the gulf of Trieste, presenting a lofty and almost inaccessible shore, where, in three coves there is anchorage for coasters, but no place of refuge for larger vessels. It may be safely approached, as at a cable from the shore the depth is from 5 to 6 fathoms, soft mud. On heights near the sea are the villages of Santa Croce, and of Opchina, the latter  $1\frac{1}{2}$  miles inland, north-eastward of Trieste.

The three coves alluded to are those of Duino, Sistiana, and Grignano. Sistiana is exposed to westerly and south-westerly winds, has a depth of

Chart, 1,434 [795].  
Var. 9° W.

about 7 feet, and the holding ground is bad. Grignano, about 5 miles south-eastward of Sistiana, affords anchorage in  $6\frac{1}{2}$  fathoms, mud, with the castle tower of Mirama bearing S.S.E.  $\frac{1}{2}$  E. 2 cables, but is also exposed to westerly and south-westerly winds. There is a short mole here, and water may be obtained from springs in both the two last-named bays.

**Harbour lights.**—The entrance to port Sistiana is marked by a small *fixed red* light at the outer end of the north breakwater, and by a *fixed green* light on the end of the south breakwater; the lights are elevated about 16 feet above the sea, and are visible at the distance of one mile. The *green* light cannot be lighted in stormy weather.

Lat. 45° 42' N.  
Long. 13° 42' E.

**Telegraph cables.**—Miramar castle, a magnificent building and conspicuous object from all directions, stands on the rocky point forming the southern side of Grignano bay; the end of the telegraph cable from Trieste to Corfu is landed southward of the point. From the coast the cable trends in a W.S.W. direction for 11 miles and then S.W. by W.  $\frac{1}{2}$  W. Mariners are cautioned not to anchor in its vicinity.

**Light.**—At Barcola, about a mile northward of the northern end of the breakwater of the new port at Trieste, is a small mole, from the head of which is shown a small *fixed* light, visible at the distance of about 2 miles, and showing *red* when bearing from N. 13° W., through north and west, to S. 13° E.; *white* elsewhere. This light cannot be exhibited during strong south-west winds.

**The GULF of TRIESTE. — General remarks. — Depths.**—The Gulf of Trieste, the north-eastern portion or head of the Adriatic, is comprised between Tagliamento point and Salvore point, which points bear from each other N.W.  $\frac{3}{4}$  W. and S.E.  $\frac{3}{4}$  E. and are about  $18\frac{1}{2}$  miles apart. From this limit the gulf recedes nearly 20 miles, and at its head or eastern extreme is the city of Trieste. The bottom throughout is of mud and clay, rendering it often difficult to weigh the anchor; the depth in no part, except close to Salvore point, exceeds 13 fathoms.

In steering for Trieste, vessels should endeavour to make the coast of Istria about Rovigno, the high steeple of which place may be seen at a considerable distance. The long flat on the northern side of the gulf near Grado, including the Mula di Muggia bank, should not be approached within a depth of 6 fathoms.

Lat. 45° 39' N.  
Long. 13° 46' E.  
Plan of Trieste  
harbour on  
Chart, 1,434 [795]

**TRIESTE.**—This large and important town, containing, in April, 1907, a population of 200,962, excluding the garrison, is situated on an acclivity at the foot of a range of hills and mountains; mount Opchina on the north, being 1,302 feet high; mount Cal on the east, 1,470 feet; and, mount Bello on the south-east, 908 feet; beyond which rise the Julian Alps, with the pass 1,800 feet, and the summit 4,000 feet, above the sea. The slopes of the hills are covered with white villas, the residences of wealthy merchants, which, being scattered in every direction, present a picturesque appearance from the sea.

The unfavourable and rocky nature of the limestone soil in the neighbourhood of Trieste and in Istria, where a large portion of the soil is sandstone, and the want of water, which in dry seasons becomes serious, render cultivation of the land far from profitable. It is best adapted for vine and olive culture, and the country population derive their subsistence chiefly from the produce of the former.

Trieste is well built and rapidly extending, but cannot be considered a healthy town, its death-rate being ordinarily high; this is attributable

partly to the insufficient water supply and to its inferior quality, and partly to the quantity of limestone dust generally floating in the air.

The industrial enterprises chiefly deserving notice, and affording employment to any considerable extent, are the shipbuilding yards and workshops of the Austro-Hungarian Lloyd's Company, usually called their Arsenal, and those of Messrs. Strudthoff and Co., called the "Stabilimento Tecnico Triestino"; there are also the engine and boiler factories of Mr. T. Holt and of Messrs. Bartlett and Greenham; also, flour mills, a chocolate manufactory, and a brewery.

An excellent chamber of commerce exists, and a school of navigation, to which an observatory is attached. The English church is in the Contrada del Fontanone.

**Trade.**—In the year 1906, 2,222 sailing vessels amounting to 100,830 tons, and 7,240 steam vessels with 2,982,049 tons, entered the port. The principal imports are, coal, coffee, cotton, oranges, dried fruit, wheat, mineral oil, olive oil, valonia, wine, &c.; the exports, beer, paper, flour, dried fruit, staves, wine, sugar, &c.

Trieste is a free port, but duties are levied by the town on spirits, wine, and fresh meat; and the Government taxes monopolies, tobacco, salt, gunpowder, &c.

**Consulate.**—A British Consul, and Consuls or Agents for all the great powers and for more than 30 different states reside in Trieste.

**Communication.**—Trieste is connected by telegraph with all the capitals in Europe, also with Cattaro and Corfu, the latter by Eastern Telegraph company's line. Vessels at Trieste can be connected with the telephone system on shore by application to the harbourmaster.

A railroad is carried over the Julian and Sømmering Alps, at a summit level of 2,893 feet above the sea, to Vienna in 24 hours, and to Venice, by Udine, in 8 hours. By the completion of the Caravanche railway (1906), direct communication is established between Trieste and Berlin, the journey occupying 24 hours. The railway station is alongside the new harbour. Steamers run regularly to the Black sea, United Kingdom, North and South America, and to all parts of the world.

Northward of the railway station is the Lazaretto, one of the largest and best arranged in Europe; it has accommodation for about 200 persons and is surrounded by a wall 24 feet high. Trieste has also an English sailors' reading room, and a civil hospital where foreign seamen are received on payment of a small charge.

**TRIESTE HARBOUR.**—The old harbour is of semi-circular form and has sufficient space for a number of vessels of any size. It is sheltered from easterly winds, but exposed to those from the westward; Santa Teresa mole, which extends northward from St. Andrea point, protects it from south-westerly winds; works are in progress north-westward of the molehead.

The depth at the entrance round the molehead is about 8 fathoms, soft mud; within and to the southward, between it and the Giuseppina mole, the water is shallow, but there is room for several vessels, and there are four buoys in this part of the harbour for the mooring of torpedo boats.

The south-eastern portion is entirely bordered by stone quays with six projecting moles or jetties. Southward of the San Carlo mole, the north-easternmost of these, is the *Mandracchio*, a small wet dock near which is the health office; and, northward of this mole, is the entrance to the basin, 20 yards wide and 12 feet deep, which extends in a south-easterly direction into the quarter of the new town called Theresien-stadt, by means of which vessels are conveniently unloaded.

Chart, 1,434 [795]  
with plan of  
Trieste harbour.  
Lat. 45° 39' N.  
Long. 13° 46' E.  
Var. 9° W.

Chart, 1,434 [795]  
with plan of  
Trieste harbour.  
Lat. 45° 39' N.  
Long. 13° 46' E.  
Var. 9° W.

**The new harbour** is northward of the old one, and in front of the railway station and Lazaretto; it is formed by a substantial quay with four broad projecting piers, sheltered by a breakwater running parallel with the shore and  $5\frac{3}{4}$  cables in length; the space between the piers varies from  $1\frac{1}{3}$  to  $1\frac{2}{3}$  cables, and there is about half that space between the pierheads and the breakwater, except at the northern entrance where a short inner transverse arm of the breakwater narrows the passage to half a cable.

The breakwater is 340 yards from the shore, 197 feet wide at the base, 59 feet at the top, and averages 66 feet in height from base to top. The depth of water within the breakwater and between the piers is from 5 to 8 fathoms.

No berths are reserved in either harbour for vessels of war. Steam vessels are usually placed alongside the projecting moles or piers, and sailing vessels alongside the quays.

The Bora reaches Trieste with great violence from the high lands in the vicinity, especially in the winter season; in the summer, westerly winds which send in a heavy swell, are the most inconvenient, but they never last long. With strong southerly winds, the water sometimes rises sufficiently to inundate parts of the town.

**Harbour works in progress.**—A breakwater, 547 yards in length in nearly a north and south direction, is under construction about half a mile westward of St. Andrea point; two other breakwaters are also being constructed, hence in the direction of Ronc point, which when completed will entirely shelter Muggia bay. These are shown in pecked lines on the plan.

At St. Andrea point, large harbour works are being carried out, and further extensive works are proposed, which, if the project is approved, will continue from those now in hand south-eastward to Lloyd's Arsenal. Northward of Servola point it is also proposed to carry out important new harbour works.

**Buoys.**—The above works are marked by two rows of warping buoys alongside the breakwater, and by a black and white conical buoy  $1\frac{1}{4}$  cables eastward of the south end of the northern breakwater.

**Prohibited area.**—During the progress of the above works, vessels are prohibited from passing within the following area, marked by pecked lines on the plan of Trieste harbour:—A line from Santa Teresa lighthouse to the breakwater North light, hence for about 9 cables, S. by W., in the direction of Ronc point, until Lloyd's pier-head is in line with the south angle of the workmen's huts of San Marco, bearing East, marking the southern limit.

**LIGHTS.**—**Old harbour.**—At Santa Teresa mole head, northward of St. Andrea point, is a round grey stone tower 103 feet in height, from which is exhibited, at an elevation of 110 feet above the sea, a *revolving white light*, with an eclipse of *seventeen seconds' duration every half minute*, visible in clear weather from a distance of 16 miles. *See view on chart.*

**Fog signal.**—In thick or foggy weather, a steam trumpet sounds *one blast of six seconds' duration, every twenty-one seconds*, it has been heard in calm weather at a distance of about 6 miles.

**St. Andrea point breakwater.**—From an iron support erected about 110 yards from the projected southern head of the north breakwater under construction off St. Andrea point, *two vertical fixed lights* elevated 31 and 24 feet above the sea, are provisionally exhibited, the upper light being *red* and the lower *white*, and visible in clear weather from distances of about 3 and 8 miles respectively.

A boat (with white disc at masthead), exhibiting *three red fixed lights, vertical*, is moored outside the north end of the northern breakwater under construction about half a mile westward of St. Andrea point, and is situated W.  $\frac{3}{4}$  S., nearly 9 cables from Santa Teresa lighthouse.

A light buoy, painted red, and exhibiting a white occulting light, is moored one cable southward of the southern breakwater under construction, from which Sottile point lighthouse bears S. 57° W., distant 9½ cables.

Chart, 1,434 [795]  
with plan of  
Trieste harbour.  
Lat. 45° 39' N.  
Long. 13° 46' E.  
Var. 9° W.

NOTE.—These lights cannot be depended on in stormy weather.

Giuseppina mole.—A *fixed green electric* light, at an elevation of 19 feet above the sea, is shown from a red iron post on Giuseppina mole-head, visible in clear weather from a distance of 4 miles.

Sanitat mole.—On the extremity of the mole jutting out from the Health office, there are exhibited from a pole *three vertical fixed* lights, *white, green, white*, elevated respectively 20, 17, and 14 feet above the sea, and visible one mile.

**New harbour.**—Breakwater, north end.—On the northern end of the breakwater are *two vertical green fixed* lights, elevated respectively 19 and 15 feet above the sea, and visible 3 miles; to be left on the starboard hand in entering from the northward.

Breakwater, Transverse arm.—A *fixed red* light, obscured towards the breakwater, 12 feet above the sea, is shown from the extreme of the transverse arm of the breakwater.

Breakwater, south end.—On the southern end of the breakwater are *two vertical fixed red* lights, elevated 19 and 15 feet, respectively, above the sea, and visible 3 miles.

**Directions. — Anchorage.** — There are no dangers in the approach to Trieste and therefore no detailed directions are necessary. The port is easily identified. Mooring buoys lie between Santa Teresa mole lighthouse and the breakwater, and though generally small vessels only make fast to them, the anchors are very heavy. There are also a number of bollard platforms to secure the bows of vessels when the stern is hauled in to the shore. Large vessels may moor outside the breakwater and the buoys in a depth of 10 or 11 fathoms.

**Tides.**—It is high water, full and change, at Trieste, at 9h. 35m.; the rise at springs is about 2 feet.

**Signal station.**—There is a signal station at Santa Teresa lighthouse.

**Distress signals.**—Vessels within sight of the Santa Teresa lighthouse, being in distress and unable to communicate by the danger signals of the International Code, should hoist an ensign reversed, or as a wheft, by day, or show a *white* light at short intervals by night.

**DOCKS, QUAYS, &c.**—Trieste owes much to the establishment of the Austro-Hungarian Lloyd's company, whose steamers, upwards of 80 in number, communicate regularly with all the principal ports of the Levant, and also, by the Suez canal, with Hong Kong, touching at Bombay, Colombo, and Singapore, with a branch line between Colombo and Calcutta. The arsenal for the repair of their vessels, southward of the town is in the northern bight of Muggia bay, at about half a mile south-eastward of St. Andrea point, it is about 25 acres in extent and comprises all the departments of a dockyard for building, fitting out, and repairing, is well supplied with workshops and machinery, and is kept in very good order.

It contains a dry dock (Austrian Lloyd's) 446 feet in length on blocks, 68 feet wide at coping, and with a depth of 19 feet over the sill. Parallel to it is Morson's patent slip, with cradle 222 feet in length, 53 feet in width, and a depth of 15 feet on its outer end; it has been used by a vessel 390 feet in length, and is capable of taking up a vessel of 2,100 tons.

Chart, 1,434 [795]  
with plan of  
Trieste harbour.  
Lat. 45° 39' N.  
Long. 13° 46' E.  
Var. 9° W.

The southern face of the arsenal is lined with quays, alongside which steamers can lie, and there are sheers for lifting 80 tons, three cranes, worked by steam, capable of lifting 60 tons each, and a floating crane for raising 30 tons. In the factory is a steam-hammer and every requisite for the repair of boilers; some 2,300 men are usually employed on the works.

At the Stabilimento Tecnico, just westward of the arsenal, are a steam factory and foundry where the largest engines are made, and where there are the means for casting a weight of 15 tons. There is also a dry dock (San Rocco) 414 feet in length over all, 66 feet wide at the entrance, and with a depth of 26 feet over the sill. This establishment employs about 1,500 men, and at both of these extensive yards vessels have been built for the Austrian and other navies.

**Coal and Supplies.**—Steam vessels can be supplied with coal in any quantity at Trieste, there being generally about 4,000 tons in stock. Vessels are usually coaled in the roads, the water being too shallow alongside the coal wharves. The average market price of coal per ton in 1907, was, Cardiff 25s., Newcastle 16s., Scotch 20s. An aqueduct constructed on the slope of mount Santa Croce, 6 miles to the northward, brings water into the town by means of pipes laid along the railway and carried down to the marina; it is supplied to shipping by the Water Company, but the quality is indifferent; water can also be obtained from the Government tank with permission of the captain of the port. All kinds of provisions, refreshments, and means for refitting vessels, are cheap and of good quality.

**Time signal.**—On a white staff at the north-western side of Santa Teresa lighthouse, and near its base, a black ball, 3 feet in diameter, is hoisted daily, 56 feet above high water, five minutes before signal, and is dropped at the instant of mean noon of the meridian of long. 15° E., corresponding to 23h. 0m. 0s. Greenwich mean time; a gun also is fired. Should the signal fail in accuracy, the ball is hoisted half way and kept so for some time. The signal is somewhat difficult to see from the anchorage.

**Salvage plant.**—At Trieste, the s.s. *Pelagosa*, tender *Audax*, and a lifeboat are available for salvage purposes; there is also a steam-pontoon for lifting weights up to 40 tons, and a steam launch with a small steam pump.

Chart, 201 [793].

**COAST.—Coast of Istria.—General remarks.**—The northern and western coasts of Istria commence southward of Trieste and terminate at cape Promontore, an extent of about 65 miles, forming numerous indentations, among which are some excellent ports, the largest being on the northern coast between Trieste and Salvore point; the safest are on the western coast, and almost every village may be said to have its little port. The shore between Salvore point and cape Promontore is bordered by numerous rocks and shoals, which in places extend more than 2 miles seaward. The soundings near the land vary greatly; between Salvore point and Rovigno the depth is about 13 fathoms, muddy bottom, outside the rocks; near the shore between Rovigno and cape Promontore it is frequently 20 fathoms, mud, close to the shore.

Istria is a mountainous peninsula, 27 miles wide from Muggia bay, near Trieste, to Volosca in the gulf of Fiume, and about 46 miles in length down its central line to cape Promontore. It produces oil, wine, wheat, honey, beeswax, silk, hides, tallow, building-timber, and salt, and possesses marble and freestone quarries. The climate is considered unhealthy; the inhabitants, about 200,000, are chiefly of Slavonic origin in the interior, and Italian near the coasts; their chief occupation is agriculture. The main railway line, passing eastward of Trieste, forms two branches at

Divaca, 10 miles eastward of that city; one passes through St. Peter to the shores of the gulf of Fiume, the other down the centre of the peninsula to its terminus at Pola, with a branch line to Rovigno. The numerous small ports on its coast are nearly all in daily communication by steamer with each other and with Trieste and Fiume.

**Anchorage.**—There is anchorage all along the coast of Istria, but regard must be had to the direction of the prevailing winds. Generally, a vessel may safely anchor during north-easterly and south-easterly winds, within a zone of from 3 to 10 miles from the land, in good holding ground. With Bora winds, if it can be avoided, a sailing vessel should never anchor between Trieste and Salvore point, and it is not safe to bring up anywhere with on shore winds unless there is every indication of fine weather; and then, preparations should be made for leaving at any moment.

**MUGGIA BAY**, southward of Trieste, lies between St. Andrea and Sottile points, which are  $2\frac{1}{2}$  miles apart; the bay recedes about 3 miles from this line to its head, but is open to north-westerly winds, which send in a considerable sea; its northern bight is part of the harbour of Trieste in which is situated Lloyd's Arsenal before referred to. The bay affords good shelter inside for small craft in a Bora and in easterly winds should they not be able to reach Trieste. There is a depth of 9 fathoms, muddy bottom, half a mile from the shore, with the steeple of Servola village bearing N.E. by E. Patches of 5 and  $5\frac{1}{2}$  fathoms exist in the north-eastern part of the bay, southward of Lloyd's arsenal.

Lat.  $45^{\circ} 37' N.$   
Long.  $13^{\circ} 46' E.$   
Chart, 1,434 [795],  
with plan of  
Trieste harbour.

With westerly winds, there is good shelter in a depth of about 8 fathoms, abreast the small village of Muggia on the southern side of the bay. Coasting vessels moor within a small mole at this village. There are no hidden dangers in Muggia bay.

With other than north-westerly winds Zaole bay, the head of Muggia bay, apparently affords good anchorage for small craft.

**Water** may be frequently procured with facility from two streams at the head of Muggia bay; there is a small run at the village, but in summer it is generally dry.

**Telegraph.**—At Servola, north side of Muggia bay, there is a post and telegraph station, with unlimited day service.

**Harbour lights.**—Sabba light, *fixed red*, elevated 18 feet above the sea, is exhibited from an iron post at the end of the petroleum pier on the north side of Zaole bay, Muggia bay; it cannot be lighted in strong north-east winds.

On Muggia mole head, a small *fixed* light, elevated 21 feet above the sea, is exhibited from an iron column, showing *red* when bearing from S.  $52^{\circ} E.$ , through south, to S.  $38^{\circ} W.$ , *white* elsewhere.

On Muggia north-west mole head there is a *fixed green* light, elevated 19 feet above the sea.

These lights are visible at the distance of about 2 miles.

**Muggia port.—Regulations for entering.**—The following regulations must be observed by vessels using the port:—

- (a.) Five minutes before leaving, vessels must hoist a square red flag by day, and a *red* light by night at the highest masthead.
- (b.) Vessels about to enter, on observing the above signals, must remain outside clear of the entrance until the departing vessel has left.

**COAST.—Sottile and Grossa points.—San Bartolomeo bay.**—At the head of the promontory separating Muggia and Capo d'Istria bays, between Sottile and Grossa points, is San Bartolomeo bay, about half a mile in extent with depths of 6 to 8 fathoms soft mud. The shore

Chart, 1,434 [795].  
Lat.  $45^{\circ} 36' N.$   
Long.  $13^{\circ} 43' E.$

Chart, 1,434 [795]  
Var. 9° W.

of this little bay is protected by high land, under shelter of which vessels of light draught anchor during the Bora and south-easterly gales; there is a mooring buoy in the bay.

On its eastern shore are the extensive buildings of the Lazaretto, and on the hill close by is Fort Olmi, 342 feet above the sea. Both points are bordered by shoal ground with 4 to 6 feet water, extending about  $2\frac{1}{2}$  cables off-shore.

**Buoys.**—The shallow water off Sottile point, the north-eastern extreme of the bay, is marked by a can buoy surmounted by a cylindrical topmark. The shoal extending from Grossa point, the south-western extreme, is marked by a white beacon buoy in  $4\frac{1}{2}$  fathoms.

**LIGHT.**—On **Sottile point** from a circular grey tower, 42 feet high, is exhibited, at an elevation of 44 feet above the sea, a *fixed white* light, visible in clear weather from a distance of 11 miles; *see* view on chart No. 1,434.

**Measured mile.**—Two beacons are erected on Sottile point, and two on Grossa point, for the purpose of indicating the length of a measured mile. The line of direction is N.  $52^{\circ}$  E. or S.  $52^{\circ}$  W., with Santa Teresa lighthouse at Trieste, directly ahead or astern; on this line the depth is 10 fathoms.

Lat.  $45^{\circ} 34'$  N.  
Long.  $13^{\circ} 42'$  E.

**CAPO D'ISTRIA BAY**, between Grossa and Ronco points, is open to the westward; these points are about  $4\frac{1}{2}$  miles apart, and the bay recedes about 3 miles. The general depth of water is from 10 to 11 fathoms all over the bay, except close inshore; at the head in Stagnon and Campi bays, the water is shallow, and the bottom soft yellow mud, as it is in the greater part of the bay. High lands rise close to the shore, the highest peaks forming mount Trajan.

The usual anchorage is in 10 fathoms, mud,  $1\frac{1}{4}$  miles north-westward of the town, sheltered from off-shore winds but exposed to those from the westward, which occasion a heavy and sometimes dangerous sea. The holding ground is not good.

**Harbour light.**—On the head of the Galere mole at Capo d'Istria, an *electric fixed green* light is shown from a green iron column, at an elevation of 17 feet above the sea, visible about 3 miles.

**The town** of Capo d'Istria has an imposing appearance from seaward. It stands on a rocky islet a short distance from the shore, and communicates with the mainland by a stone causeway. It is the chief city of the Istrian peninsula, and has a population of about 8,250, but is of less importance than formerly, owing to the proximity of Trieste, to the absence of a safe port, and to the fact of Pola having become the great naval port and arsenal of Austria. The climate is healthy, notwithstanding the close vicinity of numerous saltponds. A short mole and the coves under the town afford shelter to small coasters and fishing boats, which also seek refuge from a gale in Stagnon bay, eastward of the town, between it and the mouth of the rivulet Risano.

**Supplies.**—An aqueduct conveys a good supply of water to the seaside at la Colonne, from whence it is led into the town by mains laid under water; provisions of all kinds are obtainable. The only other resources are those suitable to the construction and refitting of small native craft.

**Vilisan point.**—**Buoy.**—Off Vilisan point, 3 miles westward of Capo d'Istria, a buoy is moored in about 2 fathoms water, near the edge of the shore bank.

Lat.  $45^{\circ} 33'$  N.  
Long.  $13^{\circ} 40'$  E.

**Isola.**—Point Isola is a small rocky projection with a village of the same name on it 3 miles westward of Capo d'Istria and joined to the main

by a low narrow strip of land. A cove, protected by a mole, has sufficient space to shelter about one hundred fishing-boats. Chart, 1,434 [795].  
Var. 9° W.

Vessels may anchor about half a mile westward of Isola in a depth of 9 fathoms, mud. Water in abundance may be obtained from a spring southward of Isola.

**Harbour lights.**—On St. Pietro rock, point del Gallo, Isola, is exhibited a small *fixed* light, elevated 16 feet above the sea, visible in clear weather at the distance of 3 miles, and showing *white* when bearing from S. 53° W., through south, to S. 37° E.; *red* from S. 37° E., through east, to N. 36° W.; obscured elsewhere.

From the New mole head a *fixed green* light is exhibited at about the same height, visible 2 miles; it cannot be lighted in northerly gales.

**Ronco point**, at the western extreme of Capo d'Istria bay, is a high cliffy point of brownish colour. Like the rest of the coast for a distance of 2 miles south-west to Madonna point, on which stands the town of Pirano, it is of bold approach.

**PIRANO BAY**, situated between Madonna point and Salvore point at 3 miles west-south-west of it, although unprotected from the Bora, affords the best anchorage on the coast of Istria for sailing vessels unable to reach Trieste, or which, being driven by strong winds from that port, are obliged to bear up for shelter. Lat. 45° 30' N.  
Long. 13° 34' E.

The bay is surrounded by high land and large vessels may anchor anywhere in depths of from 7 to 9 fathoms, soft mud, but the holding ground is bad, which renders this place dangerous in a Bora. With this wind, the anchorage under mount Mogarone, three-quarters of a mile southward of Madonna point, between Pirano and port Rose, is the least insecure; here there is a depth of 8 or 9 fathoms, mud; if possible, however, vessels should avoid riding out a Bora here, for if driven from their anchors they would be unable to gain an offing and would have the ironbound coast terminating in Salvore point as a lee shore.

Northerly and north-westerly winds, to which Pirano bay is open, are seldom strong enough to cause a vessel to drag, and at the worst she would be only forced on the mud at the head of the bay. Westerly winds send in a considerable but not a dangerous sea.

**Port Pirano** is a small inlet well protected westward by a mole; it has a depth of 2 fathoms; around it is the town which, with its environs, contains about 7,500 inhabitants, who share with Rovigno nearly the whole commerce of this coast. The steeple of St. Giorgio being 236 feet above the sea, may be seen at a considerable distance. On the shore, at the head of the bay, are several saltponds. Water and provisions may be procured.

**Coal.**—A small supply of native coal may be obtained at Pirano, about 300 to 500 tons being usually in stock; larger quantities can be supplied if notice be given.

**Port Rose.**—This small port under mount Mogarone, one mile southward of Pirano, affords shelter to small craft. The convent of St. Bernardino, on the left of the entrance, points out its position.

**LIGHTS.**—On Madonna point, from an octagonal grey tower, on the bastion of the fort, is exhibited, at an elevation of 33 feet above the sea, a *fixed red* light, visible in clear weather from a distance of 11 miles, when bearing from North, through east and south, to S. 82° W. Lat. 45° 33' N.  
Long. 13° 34' E.

At Pirano northern mole head is a *fixed green* light, elevated 18 feet above the sea, visible 2 miles; on the head of the southern or new mole, a *fixed red* light, elevated 15 feet, visible 3 miles.

Chart, 1,434 [795].  
Var. 9° W.

At Port Rose, on St. Bernardino point, a *fixed green* light is exhibited from an iron grey support near dwelling, at 23 feet above the sea, visible in clear weather from a distance of 6 miles.

Lat. 45° 30' N.  
Long. 13° 30' E.

**SALVORE POINT**, at 3 miles west-south-west from Madonna point, is the north-western extreme of the Istrian peninsula, and presents a front in that direction nearly  $1\frac{1}{2}$  miles in extent. It is low, of dark appearance, and broken into three distinct projections with small bays between them; it is dangerous in foggy weather, although there is a depth of 11 fathoms about 3 cables from it. Vessels sometimes lie almost in a calm under the land of Salvore when the heaviest Bora is blowing in the gulf of Trieste.

**LIGHT**.—On the low south-western extreme of the land forming Salvore point, is a white circular tower, with a green lantern, 95 feet in height, from which is exhibited at an elevation of 120 feet above the sea, a *fixed and flashing white* light, with a period of *half a minute*, showing *fixed, twenty-seven seconds; flash, three seconds*; short eclipses intervene. The light is visible in clear weather from a distance of 17 miles. As this light is seen from Grado in clear weather, it is useful to the navigation of the whole gulf of Trieste; see view of lighthouse on chart No. 1,434.

**Fog signal**.—In thick or foggy weather, a steam trumpet gives a blast of *ten seconds'* duration, with an interval of *thirty seconds* between each blast. In calm weather, the blasts are said to have been heard from a distance of 5 miles.

**Signal station**.—An electric telegraph station is established near the lighthouse, with which vessels can communicate by the International Code of signals.

**Dangers**.—There are several rocky heads fronting Salvore, at the distance of from half a mile to a mile from the shore, which should be avoided by vessels of deep draught.

From the For shoal, the outer danger with  $4\frac{1}{2}$  fathoms water, Salvore lighthouse bears S.S.E., distant  $1\frac{1}{10}$  miles, and the north extreme of Salvore point E. by S.

Gobbo (Humpback), a rocky shoal at a depth of  $3\frac{1}{2}$  fathoms, lies half a mile from the shore, with Salvore lighthouse bearing S.  $\frac{1}{4}$  W. distant 7 cables, and the north extreme of Salvore point E.  $\frac{1}{4}$  N.

The Or shoal, with 4 fathoms, is south-westward of the Gobbo, the lighthouse bearing S.E. distant 6 cables.

The Skar, also with 4 fathoms, and the southernmost of these dangers, is about 2 cables in length; and, from its northern end, Salvore lighthouse bears N.E. by E.  $\frac{1}{4}$  E., distant 8 cables. The bottom in the vicinity of the lighthouse is uneven and the soundings irregular.

Charts, 1,434 [795],  
201 [793].

**THE COAST** from Salvore lighthouse to Umago,  $3\frac{1}{2}$  miles to the southward, is of little height; it has several bays, with depths of 2 to  $3\frac{1}{2}$  fathoms, in which coasting vessels seek temporary refuge from the Bora.

Lat. 45° 28' N.  
Long. 13° 30' E.

**Scipar shoal** is a rocky bank about  $1\frac{1}{4}$  miles southward of Salvore lighthouse, of which parts are at times uncovered; it extends a long half mile south-westward from the shore and is abreast a small church and a few houses near the beach.

**Buoy.**—A white conical buoy, surmounted by a tripod and ball, in 19 feet water, marks the outer edge of the Scipar shoal; from it Salvore lighthouse bears North, and the ruins of Scipar castle E. by S. This buoy is liable to break adrift. Charts, 1,434 [795],  
201 [793].  
Var. 9° W.

**PORT UMAGO** is a small semi-circular bay open to the westward; the entrance is reduced to a width of about three-quarters of a cable by rocks extending towards each other from the extremes of the port. Plan of Port  
Umago on 1,559  
[796].  
Lat. 45° 26' N.  
Long. 13° 33' E.

A mole with a slight outward curve is built on the spit which projects 2 cables in a N.N.W.  $\frac{1}{2}$  W. direction from the village on the south side of the bay, having a red lighthouse at its head.

About 9 feet water may be carried through the entrance of the bay, and the depth increases inside at the anchorage, to  $2\frac{1}{2}$  fathoms, mud and sand, with the church steeple, which is 109 feet above the sea, bearing about S.  $\frac{1}{4}$  W., and the lighthouse West. The space available for anchorage is nearly 3 cables wide in each direction, and this anchorage is preferred to that of Pirano by small craft, as it is better sheltered from the Bora.

**Directions.—Beacons.**—On the northern side of the entrance to the port is the light-structure or beacon westward of Pegolotta point, in about 3 feet water, marking the shoal which extends 2 cables to its 3-fathoms edge; and, southward of that point, marking the northern side of entrance to the port, is a beacon having a stone foundation and wooden superstructure. This latter beacon stands in 6 feet water, just southward of a 4-foot patch.

Vessels entering the port should pass between the beacon and the molehead, but nearest the latter, and leaving on the starboard hand the nun buoy surmounted by a skeleton ball, in  $8\frac{1}{2}$  feet water, marking the edge of the shoal extending along the side of the mole.

There is temporary anchorage off the port about half a mile south-westward of the lighthouse in a depth of about 10 fathoms. Care is necessary when entering the port from the northward not to approach Pegolotta point too closely on account of the reef before referred to.

**LIGHTS.—Pegolotta point.**—From a conical beacon on iron frame, 38 feet in height, about 2 cables westward of Pegolotta point in about 3 feet water, a *fixed* light (unwatched) is exhibited at an elevation of 35 feet above the sea, showing *red* when bearing from S. 27° E., through east and north, to N. 32° W.; *white* elsewhere, with increased power between N. 32° W. and N. 51° W. The light is visible in clear weather from a distance of 5 miles.

From a turret above a red dwelling on Umago molehead, is exhibited at an elevation of 29 feet above the sea, a *fixed green* light, visible at 3 miles, between the bearings of N. 9° E., through east and south, and N. 36° W.

A *fixed red* and *white* lantern light is also exhibited from a post 19 feet above the sea, at the head of a small pier, inside the port, visible 2 miles, and showing *red* from N. 45° E., through east and south, to N. 75° W.; *white* elsewhere.

**The village**, containing about 2,800 inhabitants, stands on the southern side of the entrance and may be readily seen from some distance.

**Lifeboat.**—A lifeboat is stationed at Umago.

**THE COAST** from Umago to Quieto, 8 miles to the southward, is clear of outlying danger, with depths of from 8 to 10 fathoms about 4 cables from the shore; it is low and there are several small bays within this space. Chart 201 [793].

Chart, 201 [793].  
Var. 9° W.

**Port Daila**, the principal of these bays, affords shelter to coasting vessels from easterly winds, in a depth of about 4 fathoms, muddy bottom. A castle and some houses indicate the position of Daila, which is about  $4\frac{1}{2}$  miles from Umago.

**Buoys.**—A rocky bank, parts of which uncover with the tide, extends in a north-westerly direction about  $3\frac{1}{4}$  cables from the southern point of Daila bay. A white cone buoy with skeleton ball marks the northern side of this shoal in 16 feet water.

There is a mooring buoy in  $3\frac{1}{4}$  fathoms water, lying N.E. by N., distant about  $4\frac{1}{2}$  cables from Daila tower.

A stranger entering this bay from the southward, should pass westward of the white buoy in a depth of 8 or 9 fathoms, and enter nearly midway between the north and south points, with the Sanitat, on a rocky point at the head of the bay, bearing E.S.E.

Plan of port  
Quieto on 1,559  
[796].  
Lat.  $45^{\circ} 19' N.$   
Long.  $13^{\circ} 33' E.$

**PORTS QUIETO AND CITTANUOVA. — CITTA-NUOVA** is situated about  $2\frac{1}{2}$  miles south of port Daila; the town stands on the projecting point which separates the ports of Cittanuova and Quieto; it contains about 2,000 inhabitants, many of whom are fishermen.

**The port** is on the northern side of the town and open to the westward; and, being bordered by shoal water, has but a small space for anchorage about 3 cables in length by one in breadth, with a depth of 3 to 5 fathoms, soft mud. It is partially sheltered from south-westerly winds by the Val shoal which lies off the entrance. Piles are driven into the shore, to which small craft secure their cables during Bora winds. A mooring buoy lies half a cable North of the pier light. See view on plan No. 1,559.

**Light.**—From an iron support on the north-west corner of the quay, and at an elevation of 21 feet above the sea, a *fixed* light is exhibited, visible in clear weather from a distance of 4 miles, and showing *red* when bearing from N.  $51^{\circ}$  E. to N.  $83^{\circ}$  E., over Val shoal; *white* elsewhere to the northward. It cannot be lighted in strong south-west winds.

**Telegraph cable.**—The telegraph cable from port Grado is landed here.

**Lifeboat.**—A lifeboat is stationed at port Cittanuova.

**Beacon.**—About two-thirds of a cable westward of Vescovo point, there is a beacon, in 8 feet water marking the shallow edge of the shoal, consisting of an iron post surmounted by two discs set at right angles.

**The Val shoal**, on the north side of entrance to port Quieto, within a depth of 5 fathoms, is nearly 4 cables in extent, with a least depth of  $2\frac{1}{4}$  fathoms on its central part, situated  $5\frac{1}{4}$  cables W.  $\frac{1}{4}$  S. from a battery at Cittanuova. It has been reported (1904) that the depth on the shoal is less than that charted. Between the shoal and the town, there is a depth in the centre of  $5\frac{1}{2}$  fathoms, mud and shells. The light on Dente point on the southern side of the entrance to port Quieto is obscured over the shoal.

**Buoy.**—A white buoy, surmounted by a cage, in 13 feet water, is moored near the centre of the Val shoal; it is liable to break adrift.

**Quieto bank**, about one cable in extent, with a depth of  $4\frac{3}{4}$  fathoms over a rocky bottom, is situated eastward of Val shoal, with its centre  $3\frac{1}{4}$  cables S. by E. from the beacon off Vescovo point.

**Directions.**—In approaching port Cittanuova, the northern extreme of the town should not be brought northward of East, and a course should

be steered midway between the northern point of entrance and the town, as both shores, being bordered by shoal water, must be avoided.

Plan of port  
Quieto on 1,559  
[796].  
Var. 9° W.

At night, vessels should keep the *fixed white* light of port Cittanuova in sight, when within the obscured arc of the light on Dente point, in order to avoid Val shoal.

**PORT QUIETO** derives its name from the small river Quietto, which has its source in the interior of Istria, traverses Montona forest, celebrated for its curved or knee timber, and empties itself into this bay. Port Quietto is open to the westward, with depths of 11 or 12 fathoms at the entrance, shoaling to 5 fathoms, soft mud, at about a mile within Dente point; the soundings decrease gradually towards the eastern shore, which is composed of marshy ground communicating with the mouth of the river.

Lat. 45° 18' N.  
Long. 13° 34' E.

Port Quietto affords good anchorage for vessels of any size, being sheltered from all but westerly winds; these send in a considerable sea, which, however, is never dangerous, and a vessel parting from her anchors would be driven on soft mud at the head of the bay. The Bora never blows as hard here as at Pirano, and its direction is not such as to prevent egress, if it should be desirable to quit.

The best berth is in the middle of the bay, in 8 to 10 fathoms; or, off Dente bay in about 10 fathoms, a quarter of a mile from the shore.

See shoals on page 110, and view on plan No. 1,559.

The head of the narrow creek named Valditorre bay, in 10 feet water at the eastern extreme of the bay, affords security to small craft which anchor and make fast to the shore.

At Quietto, Venetian vessels of war formerly landed or shipped their guns and heavy stores when the weather did not permit of their lying safely at Peloroso road.

**Supplies.**—Excellent water may be procured in abundance at a spring close to the sea, half way between Bernazza point and the head of Valdittore bay. Oil, wine, firewood, and other small supplies may be procured from Cittanuova.

**LIGHT.**—On Dente point, the southern point of entrance to port Quietto, is a light-tower on the angle of a dwelling, from which is exhibited at an elevation of 36 feet above the sea, a *fixed white* light, visible in clear weather from a distance of 11 miles. The light is obscured in the direction of Val shoal when bearing between S. 32° E. and S. 47° E.; by avoiding this obscured sector, the shoal is cleared on either side. It is also obscured when bearing northward of N. 22° E., to clear the Civran and other shoals to the southward.

**Directions.**—On approaching port Quietto from the southward, the shore should be avoided and the lighthouse on Dente point kept eastward of a N.N.E.  $\frac{1}{2}$  E. bearing, in order to clear the Civran shoal, which is  $1\frac{3}{4}$  miles southward of the lighthouse and lies off the southern side of port Cervera. On approaching from the northward, the north extreme of Cittanuova should not be brought northward of East, until Dente lighthouse bears S.E.  $\frac{1}{4}$  E., in order to avoid Val shoal.

**COAST.**—**Port Cervera**, between Dente and Saltarel points, the latter  $1\frac{4}{10}$  miles to the southward, is about three-quarters of a mile in extent, with depths of 8 to 10 fathoms, soft mud, at its head, where there is anchorage for small vessels, sheltered from all but north-westerly winds. The south-western side of the entrance is obstructed by shallow rocky

Chart, 201 [793].  
Lat. 45° 17' N.  
Long. 13° 35' E.

Chart, 201 [793].  
 Lat.  $45^{\circ} 17' N$ .  
 Long.  $13^{\circ} 35' E$ .  
 Var.  $9^{\circ} W$ .

ground which protects it from that quarter. In entering the port, the southern point should be given a wide berth, and the northern shore be kept aboard.

The village is on rather high land on the southern side, and near it is a small stream.

**Civran shoal.**—The shallow rocky ground off Saltarel point, on the southern side of the entrance to port Cervera, extends 6 cables north-westward of the point, and then trends nearly a mile in a south-westerly direction at about 8 cables from the shore. The north-western portion is named the Erbe shoal, and on it is a rock which uncovers 2 feet; the southern and larger portion is the Civran shoal, which also has a rock above water in the middle of it, at about half a mile westward of the point.

**Buoy.**—A white buoy with staff and skeleton ball, in a depth of  $4\frac{1}{2}$  fathoms, marks the south-west extreme of Civran shoal. It lies one mile W. by S.  $\frac{1}{4}$  S. from Saltarel point.

Castagneda point northward of Cittanuova, bearing eastward of North, leads westward of the shoal; also Dente point lighthouse eastward of a N.N.E. bearing, and the light in sight at night.

Between Civran shoal and Maturaga point  $1\frac{3}{4}$  miles south of it the coast is low, and has one or two small bays, with depths of 2 to 3 fathoms, sandy bottom, open to the westward.

**Ambolizza shoal**, with a depth of 8 feet on it and deep water close to, lies about 5 cables from Maturaga point, and  $1\frac{1}{4}$  miles, N.  $\frac{1}{4}$  E. from the tower on St. Nicolo islet. To avoid this danger, keep the tower well eastward of South.

**Beacon.**—Ambolizza shoal is marked by an iron staff 21 feet high, surmounted by two discs set at right angles to each other.

**At night**, the *red fixed* light on Barbaran island in sight clears the Ambolizza and Civran shoals, as also does the light on Dente point.

**PARENZO.**—This small and ancient town, containing about 3,500 inhabitants, stands on a low tongue of land about  $4\frac{1}{2}$  miles southward of Quietto; it has a large church, a basilica of the time of Justinian (A.D. 540), one of the oldest Christian churches existing, and an old convent, near which is a conspicuous round tower. The town is scantily supplied with water by cisterns and wells. Wine and salt fish are procurable. It has daily communication by steamer with Pola and Trieste.

**The port** of Parenzo is formed by the town and Barbaran islet on its north-eastern side, and by the islets of St. Nicolo, Calbula, and Sarafel, on its south-western side, the whole group of islets and shallow water extending north-westward 7 cables from the shore. The area of the anchorage ground is 4 cables in length and about 2 cables in breadth, with depths of from 2 to 5 fathoms, hard mud and good holding ground.

For vessels drawing not more than 15 feet, this port affords the best shelter to be found on the coast of Istria, but for larger vessels it is only safe with land winds. *See view on the plan.*

**St. Nicolo islet**, 80 feet high and 3 cables in length, is connected by a shallow flat with the low islet of Calbula, half a cable north-west of it; this flat extends from Calbula to the distance of  $1\frac{1}{2}$  cables, and continues along the eastern shore of St. Nicolo nearly at the distance of a cable.

**Buoy.**—A buoy marks the north-east extreme of this flat, within which is a patch with less than 6 feet.

Plan of Parenzo  
 on 1,559 [796].  
 Lat.  $45^{\circ} 14' N$ .  
 Long.  $13^{\circ} 36' E$ .

**Boat passage.**—There is a passage 30 yards wide, with a least depth of  $2\frac{1}{4}$  fathoms, for the convenience of small craft, between the small breakwater extending from St. Nicolo and Sarafel island south-east of it. Plan of Parenzo  
on 1,559 [796].  
Var. 9° W.

Quarantine is performed on the islet; it is planted with olive trees, and on it is a convent and an ancient tower.

**Beccaria shoal**, with 6 feet water, lies 3 cables southward of St. Nicolo islet, with the tower bearing N. by E.  $\frac{1}{4}$  E.; it is marked by an iron staff 8 feet high, surmounted by a cage.

**Barbaran islet** lies about  $1\frac{1}{4}$  cables north-westward of the town, and between is a  $2\frac{1}{4}$ -fathoms channel; the current sometimes runs strong through this pass and sets towards the shoal fronting the town.

**LIGHTS.**—A *red fixed* light (unwatched), elevated 30 feet above high water, and visible in clear weather from a distance of 5 miles, is exhibited from a small iron house on a stone base, in the centre of Barbaran islet. The light is visible when bearing from S.  $13^{\circ}$  E., through east, to N.  $71^{\circ}$  E.; and from N.  $20^{\circ}$  E., through north, to N.  $43^{\circ}$  W.; obscured elsewhere.

On the head of a small mole projecting southward from the central part of the town, a *fixed green* light is shown, visible 2 miles.

**Coal.**—A small supply of coal may sometimes be obtained at Parenzo.

**Tides.**—It is high water, full and change, at Parenzo, at 9h. 20m.; the rise is about 2 feet.

**Directions.**—The best and most direct channel by which to enter port Parenzo is that between Barbaran and Calbula islets; it is about a cable wide, has a depth of 6 fathoms, and a S.E.  $\frac{3}{4}$  S. course leads directly up to the inner part of the anchorage. In order to keep well clear of the shoal water, marked by a buoy, off the northern extreme of St. Nicolo, the Barbaran side of mid-channel should be preserved.

The convent of St. Nicolo, the old tower on the north-western part of the islet, the gasometer, one-third of a mile north-east of Parenzo, and the town itself, sufficiently indicate the position of the port.

**THE COAST** between Parenzo and the canale di Leme, 6 miles farther southward, is irregular, becomes rather higher, and is indented by several bays; but, with the exception of Fontane and Orsera bays, they only afford shelter to boats or very small vessels with off-shore winds. The shore is bordered by islets, rocks, and shoals, which at one part extend more than  $1\frac{1}{2}$  miles seaward, and vessels should avoid closing this part of the coast. At night, the light on Dente point should be kept in sight, and in the daytime eastward of a N.N.E. bearing. Chart, 201 [793].

**Port Fontane**, about  $2\frac{1}{2}$  miles southward of St. Nicolo islet, is about three-quarters of a mile deep;  $4\frac{1}{2}$  cables wide at its entrance between Bassolini point, to the north, and Rovera island, on the south, and open to the westward. Its shores are surrounded by rocks and shallow water, extending between 3 and 4 cables from the head of the bay to a depth of 2 fathoms. Nearly in the centre is a rocky patch with  $2\frac{1}{4}$  fathoms; elsewhere, the depths are from  $3\frac{1}{2}$  to  $5\frac{1}{2}$  fathoms, mud. Plan of Fontane  
on 1,559 [796].  
Lat.  $45^{\circ} 11' N.$   
Long.  $13^{\circ} 35' E.$

**Shoals.—Beacons.**—In the approach to the bay, between St. Brigida islet on the north, and Rovera island, 58 feet high on the south, and, nearly equi-distant between these islets, there are several shoal patches upon which the sea breaks. The outermost patch, with a depth of  $3\frac{1}{4}$  fathoms, lies three-quarters of a mile N.W. by W.  $\frac{1}{2}$  W. from the west point of Rovera island. Shallow water extends 2 cables westward of Rovera.

Benvegnuta shoal, at  $3\frac{3}{4}$  cables W.  $\frac{3}{4}$  N. from Bassolini point, is marked by a beacon. There is a shoal with 4 fathoms between it and the outer shoal above mentioned.

Plan of Fontane  
and Orsera on  
1,559 [796].  
Var. 9° W.

On the western edge of a rock north of Fontane point, there is an iron pole, 22 feet high, surmounted by an open-work ball, painted white; there is no passage between this beacon and the point.

Reverol shoal is a rocky patch lying 2 cables W. by N.  $\frac{1}{2}$  N. from Reverol islet on the southern side of approach to port Fontane.

**The anchorage**, for small craft only, is in about 4 fathoms, mud, at  $1\frac{1}{2}$  cables from the southern shore of the bay, sheltered from all but westerly winds. Fontane village and chapel, on the southern side at the head of the bay, indicate the position of this anchorage.

To avoid the shoals at the entrance steer in with Rovera islet bearing E. by S. until within half a mile of it; then steer north-eastward towards Bassolini point, give the islet a good berth, and round it for the anchorage.

Lat. 45° 9' N.  
Long. 13° 34' E.

**PORT ORSERA APPROACH. — Marmi Grande shoal.**—Of the numerous islets, rocks, and shoals fronting the coast between Rovera island and the canale di Leme, the outer danger, the Marmi Grande, is 2 cables in length and has 2 fathoms least water, with Marmi shoal lighthouse bearing S. by E.  $\frac{1}{2}$  E. nearly 6 cables.

**A buoy**, surmounted by a tripod and bell, is moored off the north-west edge of Marmi Grande shoal.

**Marmi shoal**, situated half a mile south of Marmi Grande shoal, is more than a cable in extent. The lighthouse makes it a valuable guide to the position of other shoals in the neighbourhood.

Between Marmi shoal and Marmi Grande is the Marmi di Mezzo, with 2 fathoms water. The Campanile, with  $3\frac{1}{2}$  fathoms, and other dangers lie nearer the coast. Small craft find their way among the several islets and dangers, but large vessels should give all this part of the coast a wide berth.

**LIGHT.**—On Marmi shoal stands an iron conical tower on stone base, painted white, 28 feet in height, from which is exhibited, at 29 feet above the sea, a *fixed white* light (unwatched), visible in clear weather from a distance of 6 miles.

**Sasso reef**, situated 4 cables south-east of Marmi shoal, has on it an iron staff, surmounted by a cage painted white. There is a narrow passage between this reef and the west extreme of Lunga island, with a depth of 4 fathoms.

Lat. 45° 9' N.  
Long. 13° 36' E.

**Port Orsera**, about 2 miles south of port Fontane, is a narrow inlet half a mile deep, the inner end being very shallow; the outer part, sheltered by San Giorgio island on the south-west, affords anchorage for coasters in a depth of  $3\frac{1}{2}$  or 4 fathoms, mud. The port is open to north-westerly winds, but is partly sheltered by Galiner islet and a shoal extending southward from it, fronting the entrance. Here is found the beautiful white limestone formerly quarried in large masses, and used in the buildings of Venice.

**LIGHT.**—On the head of the landing pier in port Orsera a *fixed* light is exhibited from an iron support, at an elevation of 18 feet above the sea, showing *green* when bearing from S. 62° W., through south and east, to N 62° E.; *white* elsewhere; but from outside the harbour it is only visible as follows:—*Green* from S. 11° E. to S. 47° E.; *white* from N. 62° E. to N. 37° E., between San Giorgio island and the mainland; obscured elsewhere. This light can be seen in clear weather from a distance of 2 miles.

**Directions.**—Vessels bound to this port should pass northward of San Giorgio island and between it and Galiner islet, near the middle of the entrance, avoiding the shoal extending southward from the latter. Orsera castle, on a hill on the north-eastern side of the bay, is a good mark for the port, and when on with Galiner islet, bearing S.E. by E.  $\frac{1}{4}$  E., leads northward of the Marmi Grande shoal.

**CANALE DI LEME.**—The entrance to this narrow and deep inlet is about  $1\frac{1}{2}$  miles south of port Orsera. The channel runs in eastward nearly 6 miles, its greatest breadth being a little more than 3 cables, and it gradually narrows towards the head. It is entirely bordered by high land, the shores are steep; it has depths of from 17 to 14 fathoms, and at the inner end 10 fathoms, hard mud, good holding ground throughout.

Plan of Canale di Leme on 1,559 [796].  
Lat.  $45^{\circ} 8' N.$   
Long.  $13^{\circ} 39' E.$   
Var.  $9^{\circ} W.$

Water is scarce; a large quantity of firewood is exported.

**Conversada shoal**, situated on the northern side of the entrance to the Canale, about 6 cables south of Lunga island, has on its south-west side a floating beacon surmounted by a tripod with cage in 14 feet water.

**Leme shoal**, nearly half a mile in length, east and west, lies near the middle of the entrance. It has from  $1\frac{3}{4}$  to 4 fathoms water upon it, the least depth being near the eastern end, the edge of which is marked by a white buoy with topmark in 13 feet water.

**Fojaga shoal**, which projects southward  $1\frac{1}{2}$  cables from the northern entrance point, with 6 feet water at its extreme, is steep-to; it is marked by an iron post surmounted by two open discs, placed at right angles, 16 feet above the sea, in 13 feet water on the extremity of the shoal.

The best channel into the Canale is nearly a mile wide between Leme shoal and Croce point on the southern side of the entrance; this point is high, steep-to, and easily recognised at a distance. The channel on the northern side, between Conversada and Leme shoals, is about 3 cables wide.

**VALDIBORA BAY**, on the south side of which Rovigno is situated, is open to the westward, but is partly sheltered from north-westerly winds by the Figarola islands.

Plan of Rovigno on 1,559 [796].

**Shoals.**—Figarola bank with  $3\frac{1}{2}$  fathoms lies 2 cables north-west of the north extreme of Great Figarola island, and Mueva shoal, with  $3\frac{1}{2}$  fathoms, lies 2 cables south-east of the same island; in the centre of the bay is the Squero shoal, with 5 fathoms least water.

Between Squero shoal and the town of Rovigno the depth is 13 fathoms, mud, and this is the best berth for large vessels. Small vessels anchor farther in, and secure to the shore under the town. There are three mooring buoys in this bay.

**Rovigno.**—The town of Rovigno stands on a rocky projection terminating in St. Eufemia point, with a bay on either side of it. It contains several churches, including a cathedral built after the model of San Marco at Venice, two hospitals, manufactories of sail-cloth, ship-building yards, &c., and contains about 10,300 inhabitants. Several trading vessels belong to the port, and a number of small craft are employed in the sardine and tunny fisheries. It carries on considerable trade with Venice, Trieste, and the various ports of Dalmatia. A branch line of railway connects Rovigno with the main Istrian line about 9 miles in the interior. Water is scarce, but all kinds of provisions may be procured. See view on plan.

Lat.  $45^{\circ} 5' N.$   
Long.  $13^{\circ} 38' E.$

**Port Rovigno** is the small bay southward of the town, which is formed between it and Sta. Caterina island, about 75 feet high; the anchorage is indifferent, being entirely open to the westward, and is visited by small vessels only.

The best berth is in port Sta. Caterina, the bay south-eastward of Sta. Caterina island, which is connected with port Rovigno by a 3-fathoms channel between the eastern end of Sta. Caterina island and the shore, the shoal water extending east from the island being marked by a beacon with white ball; vessels passing from one port to the other must keep eastward of this beacon.

Plan of Rovigno  
on 1,559 [796].  
Lat. 45° 5' N.  
Long. 13° 38' E.  
Var. 9° W.

There are two mooring buoys in port Rovigno. Boats find shelter on the eastern side of a mole projecting about a cable southward from the town.

**Sassi bank**, with  $3\frac{1}{2}$  fathoms, lies nearly 2 cables westward of Sta. Caterina island. Bagnole islet, which is steep-to, lies about 6 cables westward of Sta. Caterina.

**Lights**.—From an iron turret situated 54 yards within St. Eufemia point, at an elevation of 59 feet above the sea, a *fixed red* light is exhibited, visible at the distance of 5 miles between the bearings of S. 69° W., through south and east, to N. 9° E.

On the mole-head at port Rovigno, a *fixed* light is exhibited from a green iron standard, elevated 19 feet above the sea, and visible from a distance of 2 miles, which shows *green* when bearing from S. 17° E., through east, to N. 17° W.; *white* elsewhere.

On the quay in Valdibora bay, a *fixed green* light is exhibited from an iron support, visible 2 miles, between the bearings S. 35° W., through south, to S. 84° E.

**Coal**.—Coal can be obtained at Rovigno, about 1,000 tons being kept in stock.

**A lifeboat** is stationed at Rovigno.

Chart, 201 [793].

**COAST**.—**Beacon**.—On **Asino shoal**, about  $1\frac{1}{4}$  miles south of Rovigno, in  $6\frac{1}{2}$  feet water, there is a beacon 18 feet high, consisting of a staff surmounted by two open discs, painted white. Vessels should not pass between this shoal and Asino islet.

**Directions**.—On making the land when abreast of Rovigno, the high conspicuous steeples of St. Eufemia at Rovigno will be readily made out. Vessels from the southward may pass at a short distance westward of San Giovanni di Pelago, Astorga, and St. Andrea islets, and inshore of Bagnole islet. The north-western side of San Giovanni di Pelago is shoal.

Bagnole, a small islet 6 cables westward of Sta. Caterina, is steep-to, and may be passed on either side as most convenient.

The passage on either side of Sta. Caterina island may be taken by small vessels; they must avoid its south-eastern extreme, which is shoal about half a cable off.

**Anchorage**.—There is temporary anchorage off Rovigno in a depth of about 17 fathoms, sandy bottom, with the cathedral bearing about E.  $\frac{1}{2}$  S. distant  $3\frac{1}{2}$  miles, and San Giovanni di Pelago lighthouse S.E.

**THE COAST** from Auro point, the south extreme of port Sta. Caterina to the Fasana channel, 9 miles further south, is not so high as in the vicinity of Rovigno and gradually become lower towards the south. There are several small bays, seldom visited except by coasters to load with firewood, and all are open to the westward. As far as Barbariga point, 6 miles south-eastward of San Giovanni di Pelago lighthouse, it is bordered by islets or rocks and sunken dangers, which, except the Porer shoal, do not reach more than three-quarters of a mile from the shore. The southernmost of the islets is Porer.

**LIGHT**.\*—**San Giovanni di Pelago**.—At  $2\frac{1}{2}$  miles S.S.W.  $\frac{1}{4}$  W. from Rovigno, a chain of islets extending southward terminates in the little islet of San Giovanni di Pelago, on which is a

\* The Austro-Hungarian Government gave notice, dated 21st April 1906, that, owing to defects in the apparatus, the fixed white and red flashing light on San Giovanni di Pelago would show *red fixed* until further notice. Information, dated 13th May 1907, has now been received from Mr. C. Barron, master of the *s.s. Douro*, that this light still shows *red fixed*.  
General chart 1,440 [789].

white octagonal tower with green lantern, 54 feet high, with dwelling attached, from which is exhibited at an elevation of 73 feet above the sea a *fixed* and *flashing* light visible in clear weather from a distance of 14 miles, showing thus:—*White fixed, sixty-two seconds; faint light, thirteen seconds; red flash, five seconds; faint light, ten seconds.* This light is said to be unreliable. See view on chart, No. 201.

Chart, 201 [793].  
Var. 9° W.

**A sunken rock** lies about  $1\frac{1}{2}$  cables N.N.W. of the islet.

**St. Andréa**, the largest of the group northward of San Giovanni di Pelago, 62 feet high, and nearly divided into two by a low neck in the centre, is covered with wood and has a monastery on its northern part; shallow water extends a short distance westward from this islet.

**Porer shoal** has  $4\frac{1}{2}$  fathoms water over it and is the outer danger off this part of the coast. It is steep-to, with depths of 10 to 18 fathoms close around, and lies  $1\frac{3}{4}$  miles from the coast, with Porer islet bearing E.  $\frac{3}{4}$  N.  $1\frac{2}{10}$  miles; and San Giovanni di Pelago lighthouse N.N.W.  $\frac{3}{4}$  W.  $4\frac{1}{4}$  miles.

Plan, 202 [797].  
Lat. 44° 59' N.  
Long. 13° 41' E.

Dignano church tower in line with the Red lime kiln on the eastern shore of Fasana channel, bearing E. by S.  $\frac{3}{4}$  S., leads southward of the Porer shoal.

**BRIONI ISLANDS.**—The northern extreme of these islands lies 8 miles south-eastward of San Giovanni di Pelago light; they lie nearly parallel with the coast and are separated from it by the Fasana channel. The islands are of marble, ranging from about 50 to 100 feet in height, and are covered with fine underwood and aromatic shrubs; their shores are irregular and broken by many little bays and inlets. Numerous islets, rocks, and shoals lie on their western and northern sides, and the whole together occupy a space about 4 miles in length by 2 miles in breadth.

Plan, 202 [797].  
Port Pola and  
Brioni islands.  
Lat. 44° 59' N.  
Long. 13° 44' E.

The two principal islands are Scoglio Grande and Scoglio Minor. The highest point is about the centre of Scoglio Grande, the southern island; on it stands Fort Tegetthof, and the little village of Brioni is in the small bay north-eastward of the fort. Scoglio Minor, the northern island, has a bay on its southern side, in which coasting vessels anchor in about 4 fathoms, muddy bottom, and are well sheltered by Scoglio Grande.

North-westward of Scoglio Minor is a group of five islets surrounded by shoals, and nearly connected with the island by reefs. About 6 cables outside or westward of these islets, and extending  $1\frac{2}{10}$  miles from Scoglio Minor are four shoals, of which the Cabula, the most northern, is awash; the others are covered with from 2 to 3 fathoms water.

Southward of the northern islets is another group of five islets a short distance westward of Scoglio Grande and sheltering an indentation in that island named Madonna bay.

There is a 4-fathoms channel into the bay northward of Gallia, the northern islet; a 10-fathoms channel between Orsera, the southern islet, and the shore of Scoglio Grande; and a  $5\frac{1}{2}$ -fathoms channel between Orsera and Vanga island, the next islet to the north-westward. Half a mile N.W. by N. from the west end of Gronghera, the western islet of the southern group, is the shoal of the same name with 3 fathoms water.

Small vessels may safely anchor in Madonna bay in 4 to 5 fathoms; Pojer shoal, in its northern entrance channel, is marked by a perch beacon. The largest of the five islets and the only one wooded is Vanga. For further details, see the plan.

Plan, 202 [797].  
Pola, and Brioni  
islands.  
Lat. 44° 57' N.  
Long. 13° 43' E.  
Var. 9° W.  
Lat. 44° 53' N.  
Long. 13° 45' E.

**LIGHTS.—Cabula shoal.**—A *fixed white* light (unwatched), elevated 21 feet above the sea, is exhibited from an iron framework 26 feet high, on Cabula shoal at the north-west extreme of the group, visible in clear weather from a distance of 9 miles.

**On Peneda (Pedena) point**, the south extreme of the Brioni islands, at 40 yards within the coast, is a square tower adjoining dwelling 49 feet high, from which at an elevation of 65 feet above the sea, a *flashing white* light is exhibited, which shows a *flash of five seconds'* duration every *thirty seconds*. It is visible in clear weather from a distance of 14 miles when bearing from S. 57° E., through east and north, to S. 67° W., a faint light being visible beyond those bearings to S. 47° E. on one side, and S. 59° W. on the other, from a distance of 3 miles. *See sketch on plan.*

Several electric lights, one of which is shown from a high pole, are exhibited near the lighthouse.

**Girolamo.—Leading lights.**—In Fasana channel, between the Brioni islands and the mainland, from an iron framework on the north side of Girolamo island, a *fixed red* light, elevated 15 feet above the sea, is exhibited, visible in clear weather from a distance of 3 miles, when bearing from S. 75° W., through south, to N. 79° E.

At 211 yards S. 16° W. from the above another *fixed red* light, elevated 35 feet above the sea, is exhibited from an iron crane, also visible 3 miles, between the bearings S. 46° W., through south, to S. 69° E.

These lights in line, bearing S. 16° W., lead in mid-channel between Rancon point shoal and Cosada shoal.

On the north-west point of Girolamo, *two fixed green* lights, placed vertically 24 feet and 30 feet above the sea, are exhibited from an iron crane; they are visible at 2 miles between the bearings S. 50° W., through south and east, to N. 2° W.

*See also Lights, page 119.*

**Anchorage.**—In case of necessity during a Bora, a vessel may anchor  $1\frac{1}{2}$  miles westward of Vanga islet, west side of Brioni island, in a depth of about 20 fathoms. Also about three-quarters of a mile south-westward of cape Compare at the entrance to Pola, in 22 fathoms, with cape Compare lighthouse about N.E.  $\frac{1}{2}$  E. At both anchorages, vessels are exposed to westerly and southerly winds.

**Telegraph.**—There is a telegraph and telephone station at Brioni.

**CANAL DI FASANA (Fasana channel)** is between the Brioni islands and the coast. In its northern portion, a considerable number of vessels of any size may find shelter from all winds but those from north-west, in which direction the channel is open; the southern portion, although of sufficient depth, consists of a bed of rocks uniting the Brioni islands with the coast, and is bad holding ground.

Large vessels should anchor in about 9 fathoms, mud and shells, with the eastern extreme of Scoglio Grande bearing about S.  $\frac{3}{4}$  W., and Fasana village S.E. by E. Small craft generally anchor at a short distance from the village, with it bearing about S.E.  $\frac{1}{4}$  S. A great quantity of fish may be caught here.

**Submarine mining ground.**—This practice ground extends for about one mile from Femmina point (Scoglio Minor island) in the direction of Barbariga point, the limits being marked during practice by four boats each flying a red flag, and exhibiting *two fixed red* lights at night, vertically placed. This area must not be entered by vessels or boats.

**Mooring buoys.**—There are sixteen mooring buoys in two lines on the eastern shore of Fasana channel, northward of Fasana village. The outer row of buoys are at an average distance of 330 yards from each other, inner row 270 yards from one another. They extend in a northerly direction from abreast of Fasana village.

Plan, 202 [797].  
Pola, and Brioni  
islands.  
Var. 9° W.

**Fasana harbour.**—The small harbour of Fasana is formed by two moles, enclosing an area with a depth of about 6 feet.

Lat. 44° 56' N.  
Long. 13° 48' E.

The shores in the vicinity of Fasana are generally low, well wooded, and cultivated. Dignano village,  $2\frac{1}{2}$  miles inland and on a hill 423 feet high, the clock tower of which is visible at a considerable distance, helps to point out the position; it bears N.E. by E. from Fasana.

**LIGHTS.**—Fasana. — *Two fixed red* lights, vertical, elevated respectively 42 and 59 feet above the sea, and appearing as one light over a distance of 4 miles, are exhibited from the steeple of the church of Fasana. They are visible, at the distance of 10 miles in clear weather, from the bearing of S. 19° W., through south and east, to N. 19° E., but obscured by the Brioni islands from S. 66° E., through east, to N. 44° E., also by Girolamo island from N. 34° E. to N. 26° E., though visible over the saddle of that island on a N. 31° E. bearing.

From an iron framework at the extreme of the north mole, at 21 feet above the sea, is shown a *fixed green* light, visible one mile.

From an iron post on the south mole head a *fixed red* light, elevated 19 feet above the sea, is shown, visible from the distance of 2 miles.

**Telegraph.**—There is a telegraph station at Fasana.

**Cosada shoal.**—At the southern end of the Fasana channel are the two islets Girolamo (lights upon, *see* page 118) and Cosada, having a narrow  $4\frac{1}{2}$ -fathoms passage between them. About a third of a mile northward of Cosada islet is Cosada shoal, about 2 cables in extent, with  $2\frac{1}{2}$  fathoms least water. Fort Musil, just over Cristo point bearing S.  $\frac{1}{2}$  W., leads westward of the shoal and in the deepest water between the two islets; *see* view on plan.

**Floating beacons.**—The eastern coast of Scoglio Grande is bordered by shallow water, and its edge at Rancon point is marked by a truncated pyramid beacon 8 feet high and four-sided, each side painted half white and half red vertically, with the words 10 *metres* in black ( $5\frac{1}{2}$  fathoms), the depth of water in which the beacon is moored. A similar beacon, in  $4\frac{1}{2}$  fathoms, marks the western edge of the Cosada shoal.

**DIRECTIONS.**—Vessels passing northward of the Brioni islands on the way to Fasana, round Cabula shoal lighthouse at a prudent distance. Porer shoal, on the north side of approach, with the clearing mark south of it, has been described on page 117. There are no other dangers worth mentioning here.

**Anchorage** may be taken off Fasana in any required depth. *See* mooring buoys, above.

**Proceeding through Fasana channel.**—The channel between the Cosada shoal and that extending from the Brioni island, between the depths of 5 fathoms on either side, is only  $1\frac{1}{2}$  cables wide, and carries from 6 to 11 fathoms. After passing between the floating beacons, with the light-structures (*red* lights at night) in line, bearing S. 16° W., vessels may, if preferred, keep westward of Girolamo (north-west point marked by *green* light at night) the channel between it and Scoglio Grande being perfectly clear; with the flood tide and a north-westerly breeze there is a strong southerly stream through this passage, sometimes amounting to 3 or 4 knots.

Plan of Pola, &c.,  
202 [797].  
Var. 8° 50' W.  
Lat. 44° 52' N.  
Long. 13° 50' E.

There is anchorage for small vessels in Ronzi and Bandon bays, north-eastward of Cosada islet, in depths of 4 or 5 fathoms.

**POLA.—The town of Pola**, built on the southern shore of the inner harbour, is one of the most ancient in Istria, and several interesting Roman remains are still visible, particularly the Amphitheatre built of massive blocks of white marble, a most conspicuous object when approaching from the sea. The only other building deserving special notice is the cathedral, built in the ninth century. Pola being in the neighbourhood of marshy grounds was formerly very subject to fever and ague; extensive plantations of the eucalyptus have greatly reduced sickness from this cause.

**Naval station.**—Being the principal Austrian naval station, it has its government dockyard, with building slips, dry docks, large slip and balance dock, steam hammers, moulding appliances, and marine hospital where English seamen are admitted on payment of maintenance, barracks, &c. There is also a commercial port within and eastward of Olivi islet, without dock or any means for executing any but light repairs. Extensive fortifications crown the heights round the port, and numerous forts and batteries command the entrance.

Pola is the terminus of the Istrian railway by which it is in direct communication with Vienna, and by branch lines with Rovigno, Trieste, Fiume, &c. The station is at the eastern side of the town. *See* view on plan.

The civil population is small, the principal part of the inhabitants being the government workmen, sailors, and soldiers; the total was about 36,000 in 1906.

Pola being essentially a military port has little or no trade, the imports being for local use and for the military establishments. A small quantity of wood, lime, and stone is exported to Italy.

**Communication** is maintained with Trieste, Fiume, and Dalmatia by the steamers of the Austro-Hungarian Lloyd's company.

**THE PORT** is an exceedingly fine basin almost land-locked, with room for a great number of vessels of any size, and, as it is surrounded by hills, the Bora is seldom felt with much force. The entrance is open to the north-westward and is between Christo point on the north and cape Compare, which is rather high and steep, on the south. From thence the port trends first south-eastward and then north-eastward, forming a bend to the southward. About  $1\frac{1}{4}$  miles within the entrance, are three small islets dividing the interior into two almost equal parts, the outer and inner harbours; these islets are, Sta. Catarina, a low islet on the north; St. Andrea, the middle islet, large, rather high, and strongly fortified; and, St. Pietro, a few yards from the southern shore, low, connected with the shore by a causeway, and also fortified.

**Inner harbour.**—The passage for large vessels into the inner harbour is between St. Andrea and St. Pietro islets; it is about a quarter of a mile wide, and has a depth of 13 to 14 fathoms in the fairway, and 11 fathoms in the anchorage off the arsenal. A shoal extends a short distance from St. Pietro; it is marked by a white floating beacon moored on its eastern edge about half a cable from the islet.

The passage between the two northern islets, and also between them and the northern shore, is fit only for vessels of light draught.

**Dockyard.—Olivi islet.**—In the inner harbour, off the town, is the islet of Olivi, so named from its having been formerly covered with olive trees; it is now occupied by the government workshops and buildings, and is connected with the dockyard in the town by a mole and an iron swing bridge, which opens to admit of vessels passing through into the

Commercial port. On this island are two large building slips, roofed, and two dry docks, one being large enough to take an ironclad; also, a patent slip worked by a balance or floating dock, the vessel being first lifted in the dock, and then run on to the slip on prepared ways and shored up as usual. Three buoys are moored off the balance dock to mark the distance within which passing vessels should not approach it.

Plan of Pola, &c.,  
202 [797].  
Lat. 44° 52' N.  
Long. 13° 50' E.  
Var. 8° 50' W

A rocky shoal extends north-eastward from Olivi, leaving a 3-fathoms passage between it and the shore bank; the edges of the shoal are marked by buoys. A disc on the lamp post at the landing place, in line with a disc on the north-east angle of Casa Wassermann, leads eastward of Olivi shoal.

The depths in the Commercial harbour are being increased by dredging.

**The anchorage** is everywhere good and there are many large mooring buoys in the inner harbour, and six also westward of St. Andrea islet in the outer harbour, painted red with white top; these latter are used for swinging ships for deviation, and, being close together, could not be used for long vessels, except the West buoy, No. 22, where there is clear swinging room. The best berth is southward of Olivi islet, in a depth of 11 fathoms, tenacious mud. Small vessels make fast to the quays of the town.

**Foreign war vessels.**—No foreign vessel of war is allowed inside Fort Franz, St. Andrea islet, without special permission from Vienna. It is therefore necessary for such to anchor in about 16 fathoms, outside St. Andrea islet, or to make fast to the buoy. The anchor should be let go nearer the southern than the northern shore, to avoid the sea which sets in with strong westerly winds.

**Time signal.**—A black ball is hoisted five minutes before signal daily, and dropped by electricity from the Observatory\* at mean noon of the meridian of long. 15° E., corresponding to 23h. 0m. 0s. Greenwich mean time, at the south-western bastion of Harbour castle, 131 feet above high water. A gun is fired at the same time.

\*Lat. 44° 52' 8" N.  
Long. 13° 50' 45" E.

If one or more vessels desire to know the mean noon time of Greenwich, they should communicate in time with the Hydrographic department, and it will then be signalled in the same manner as mean noon time of Pola.

When signal fails in accuracy, the ball is hoisted half way up, and left in that position about half an hour.

Should anything occur to prevent the use of the apparatus, the time of mean noon is signalled from the Hydrographic department by lowering a blue flag at the exact time.

**Tides.**—It is high water, full and change, at Pola, at 9 h. 16 m.; the rise is about 3½ feet.

**LIGHTS.**—A *fixed white* light is exhibited from an iron standard 21 feet in height at cape Compare, south side of entrance to the port, at an elevation of 56 feet above the sea, and 13 yards within high water mark, visible when bearing from N. 57 E., through east, to S. 57 W., from a distance of 10 miles in clear weather.

A light-buoy, in connection with the harbour works in progress, is moored North, distant 3 $\frac{8}{10}$  cables from cape Compare lighthouse, from which is exhibited an *occulting white* light every ten seconds, thus:—Light, eight seconds; eclipse, two seconds.

This buoy will be moved northward as the works progress.

**Fort Franz.**—At the south point of St. Andrea islet, on the northern side of the passage into Pola, is exhibited from a small black hut, a *fixed red* light (unwatched), elevated 17 feet above the sea, and visible from a distance of 3 miles.

Plan of Pola, &c.,  
202 [797].  
Lat. 44° 52' N.  
Long. 13° 50' E.  
Var. 8° 50' W.

On St. Pietro islet on the southern side of the passage, is a small *fixed green* light, shown from an iron support at an elevation of 20 feet above the sea, and visible 2 miles. These two lights can be seen from the entrance of the port, and within the port the *red* light remains in sight to within about a cable southward of Olivi islet.

Harbour lights.—Three lights are exhibited along the bridge connecting Olivi island with the town, showing *red* in the direction of the Commercial port.

In San Pietro bay, N. 7° E. distant 3 cables from the railway station, are exhibited two *white fixed* lights, placed vertically on a pole and elevated respectively 28 and 34 feet above the sea, visible 2 miles.

From the head of a mole, 492 feet in length, situated about one cable north of the Health office, are exhibited three *fixed* lantern lights, in the form of an isosceles triangle, point up, showing *red* seawards, *white* landwards, the dividing line between the colours being N. 69° W. and S. 69° E.

Two *fixed green* lights placed horizontally 5 feet apart, and elevated 105 feet above the sea, are exhibited from the roof of a house situated about 45 yards northward of the Amphitheatre.

**Torpedo ground.**—On the north-eastern side of the entrance to Pola, between Grosso point and Zonchi battery, is a space generally used for submarine mining or torpedo experiments. During practice with submarine mines in the outer port, the direction of the line in which the mines are laid will be marked at each extreme by a red flag during the day, and at night by a *red* light above a *white* light, 1½ feet apart. These signals will be hoisted on the mast of the guard ship moored near the middle of the outer port, and on a mast erected in Fisella valley, on its south-west shore.

During the practice, all vessels are required to pass northward of the guard ship, that is, between her and Zonchi bay.

Torpedo experiments are sometimes conducted on the south-western shore near Fisella battery, in which case similar precautions are taken to keep vessels clear of the ground.

Gun practice by the Imperial Navy is at times carried out in Valmaggiore bay, when navigation is prohibited within the line joining Cristo and Grosso points.

**Rifle and gun practice ground.**—The area seaward between Stoja point, on the north, and San Giovanni point, on the south, is reserved for small arm and gunnery practice.

During small arm practice one red ball will be shown from flagstaffs at Monte Saline, at Stoja point and at Verudella fort.

During gun practice, two red balls will be exhibited from the above-mentioned places.

These balls will be hoisted one hour before the firing commences.

Vessels passing along the coast are prohibited, when these signals are hoisted, except under pressing necessity, from passing inside a line joining Stoja point to San Giovanni point. Fishing is prohibited within 2 miles seaward of this line, and vessels beating to windward must keep the same distance from it, except in case of urgent necessity.

A naval tender or steam launch will be at hand to enforce the above regulations, the infringement of which is punishable by a fine.

**Measured mile,** *see* page 124.

**Regulations for entry and exit.**—Vessels proceeding in or out of the Central Naval harbour, are not allowed to exceed a speed of 6 knots when eastward of a line joining San Pietro and St. Andrea. Plan of Pola, &c.,  
202 [797].  
Var. 8° 50' W.

Lighters displaying the flag V, International Code, show that divers are at work and such lighters must be passed at a distance of  $2\frac{1}{2}$  cables with the vessel's engines stopped.

**Docks.**—There are dry docks on Olivi island:—No. 1 is 318 feet in length on blocks, and 452 feet over all, with breadth  $82\frac{1}{2}$  feet, and depth on sill 27 feet. No. 2 dock is 411 feet long on blocks and 450 feet over all, with breadth 91 feet, and depth on sill 29 feet.

There are also two Balance or floating docks:—No. 1 is 468 feet in length over all, with breadth 83 feet, and depth on sill 28 feet. No. 2 Balance dock is 461 feet in length over all, with breadth 85 feet, depth on blocks 33 feet, and lifting power of 15,000 tons.

These are all Government docks, and are only available to merchant vessels under extraordinary circumstances.

**Coal and Supplies.**—The Austrian government has a large coaling station here, with about 30,000 tons in stock, but foreign vessels can only be supplied from it in cases of necessity. There is also a stock of about 3,000 tons in private stores. Water is abundant and may be obtained at several places; a supply sufficient for a fleet may be procured from a spring called the Roman baths, near the beach about 2 cables from the town.

**Meteorological Table.**—See page 377.

**Directions.**—The land about Pola generally is not high, and the only remarkable points near the entrance are capes Compare and Brancorso,\* each with a fort or battery over them; both are steep and are the highest points on this part of the coast. The latter is about  $7\frac{1}{2}$  miles north-westward of cape Promontore and may be easily recognised from it, being the first rather high land northward of that cape.

\*Lat. 44° 52' N.  
Long. 13° 48' E.

On approaching the harbour, the square fort, the town, and the Amphitheatre may be seen at the head of the bay, and, as there are no sunken dangers and but one passage into the port for large vessels, viz., between St. Andrea and St. Pietro islets, a vessel has no difficulty in reaching the anchorage; see view on plan. Vessels entering or leaving the Commercial harbour must give a good berth to the Balance docks in passing them.

Vessels are prohibited from passing between the light-buoys off cape Compare and the southern shore; works are in progress here for constructing a jetty.

At night, the *fixed white* light on cape Compare, and the *fixed and flashing* light on Peneda (Pedenà) point, the south extreme of the Brioni islands, indicate the position of the port. A sailing vessel prevented by contrary winds from entering, may anchor in about 20 fathoms, mud, under the land between the two capes.

**THE COAST**, southward of cape Brancorso, is uncultivated and gradually decreases in height towards cape Promontore, about  $7\frac{1}{2}$  miles distant. There is, generally, a depth of 20 fathoms at 3 or 4 cables from the shore. There are several small bays which afford shelter from off-shore winds; of these the most important are ports Veruda and Olmo. Chart, 201 [793].

Mount Cope, 187 feet high and 5 miles southward of cape Compare, separates the ports of Olmo grande and Olmo piccolo. Olmo grande is a narrow inlet affording shelter from all winds to vessels drawing not more than 10 feet. Olmo piccolo, to the southward, is more exposed and suitable for boats only. Lat. 44° 49' N.  
Long. 13° 52' E.

Chart, 201 [793].  
Var.  $8^{\circ} 50'$  W.

**Measured mile beacons** are erected on this coast for trying the speed of vessels:—The northern rear beacon is on the summit of a hill 106 feet high westward of the Marine hospital at Pola; the front beacon bears from it S.  $35^{\circ}$  W. about  $4\frac{1}{2}$  cables. The southern rear beacon is on the southern slope of mount Cope, eastward of mount Bombista; the front beacon bears from it S.  $35^{\circ}$  W. and is about half the distance between it and the shore. The distance from the line of the northern beacons in line to the southern beacons in line, on a S.  $55^{\circ}$  E. course, is 3 miles. This distance is divided by other beacons into three one mile sections, the centre mile being subdivided into two half mile sections.

The line of direction on which to run the measured distance, N.  $55^{\circ}$  W. and S.  $55^{\circ}$  E., is shown by two beacons erected on cape Promontore, about  $2\frac{1}{2}$  cables within Chersine point.

Austrian war-vessels, when running on this measured distance, carry a pennant above flag A of the International Code, and all vessels are warned to keep clear of them when they are displaying this signal.

**Target practice marks.**—The undermentioned buoys and a lighter in connection with gunnery practice, in the approach to port Pola from the southward, are at times moored in the following positions off the coast:—

- (a) A buoy, at a distance of  $4\frac{4}{10}$  miles S.  $37^{\circ}$  W. from fort Musil.
- (b) A buoy, at a distance of  $2\frac{1}{10}$  miles S.  $5^{\circ}$  W. from fort Musil.
- (c) A lighter, at a distance of 3 miles S.  $22^{\circ}$  W. from fort Musil.

**NOTE.**—As a warning to seamen these marks are retained on chart, No. 201, although they are only occasionally in position.

Plan, 202 [797].

**Saccorgiana bay.**—**Buoys.**—Off Saccorgiana bay,  $2\frac{1}{2}$  miles south-eastward of cape Compare, there is moored a conical buoy, and also two mooring buoys.

Plan of port  
Veruda on 202  
[797].  
Lat.  $44^{\circ} 50'$  N.  
Long.  $13^{\circ} 50'$  E.

**PORT VERUDA** is  $3\frac{1}{4}$  miles south-eastward of cape Compare, and consists of two narrow inlets bordered by hills from 100 to 140 feet high. The passage to Cacoja bay, the southern inlet, is both shallow and narrow; access to it is round the northern end and eastern side of Veruda islet; the northern inlet is easier of access and to be preferred; here vessels anchor with mount Gallie bearing E. by N.  $\frac{1}{2}$  N., in a depth of 4 or 5 fathoms, hard mud, and are well sheltered from all winds. This inlet extends 7 cables beyond the anchorage given, but the water almost immediately above the anchorage shoals to 6 feet and less.

A vessel prevented by contrary winds from entering port Veruda, may anchor in a depth of about 23 fathoms, sand, shells, and mud, between Veruda islet and St. Giovanni point.

**LIGHT.**—At Verudella point, on the northern side of entrance to port Veruda, is exhibited a *fixed red* light from an iron crane adjoining shed, at an elevation of 33 feet above the sea, visible in clear weather from a distance of 6 miles, between the bearings S.  $56^{\circ}$  E., through east and north, to N.  $19^{\circ}$  W., and from N.  $79^{\circ}$  W., through west, to S.  $37^{\circ}$  W.; obscured elsewhere.

**Directions.**—Veruda islet, 62 feet high, is at the entrance of the two inlets forming the port and may be recognised by a ruin on its summit. Two other islets, Bisse and Frasher, are just southward of it, and the three are united to the coast by reefs. The entrance is between Veruda islet and Verudella point on the north. Cape Promontore assists to indicate the position to vessels approaching from the southward, and

capcs Compare and Brancorso to those from the northward. At night, the *red* light shows the entrance to the port. Charts, 201 [793]  
200 [792]  
2,711 [798].  
Var. 8° 45' W.

As foul ground extends around Verudella point, it should not be approached nearer than a cable.

**CAPE PROMONTORE**, the south extreme of Istria, is a low narrow hilly projection, difficult to define when the atmosphere is not very clear. There are the Porer rock and several other dangers off the cape, and the currents are often rapid with strong eddies in its vicinity caused by streams setting out of the gulf of Quarnero. Lat. 44° 46' N.  
Long. 13° 55' E.

It is customary for vessels bound to Venice or its neighbourhood to sight cape Promontore; on approaching it from the eastward in clear weather, the steeples of the three villages of Sisano, Medolino, and Promontore may be seen on the hills in succession, together with the Porer rock lighthouse; when from the opposite quarter, the steeple and village of Promontore only, with Porer lighthouse, are visible.

**The PORER ROCK**.—This rock, rising about 23 feet above the level of the sea, lies S.W.  $\frac{1}{2}$  W. nearly one mile from the western extreme of cape Promontore. A rocky shoal, with a depth of 3 fathoms, extends  $2\frac{1}{2}$  cables south-westward from Porer rock; and between the rock and the shore are many shoal patches described below.

**LIGHTS**.—From the white lighthouse, with green lantern, on the Porer rock, 102 feet in height, and at an elevation of 111 feet above the sea, is exhibited an *occulting white* light, showing thus:—Light, *three seconds*; eclipse, *half a second*. The light is visible in clear weather from a distance of 16 miles, when bearing from S. 25° E., through east and north, to S. 83° W. See sketch on charts, Nos. 201 and 2,711.

From the semaphore platform, 33 yards from the southern extreme of the Porer rock is exhibited a *fixed* light, visible 4 miles, elevated 39 feet above the sea, showing as follows:—*Red* (in the direction of Sunk rock and for 3 cables on each side of it) when bearing from N. 1° E. to N. 25° W.; *green* from N. 1° E. to S. 84° E.; *white* from N. 25° W. to S. 87° W.; obscured elsewhere.

**Fog signal**.—During thick or foggy weather, a steam fog horn gives *two blasts every minute*, thus:—Blast, *five seconds*; silence, *five seconds*; blast, *five seconds*; silence, *forty-five seconds*. In calm weather, it may be heard from a distance of 6 miles.

**Semaphore**.—There is a semaphore station on Porer rock, and telephonic communication is established with Pola, Fasana, and Brioni.

**Felonoga islet and shoals**.—Felonoga islet is about a cable off the western extreme of cape Promontore, on the north-western edge of a rocky ledge extending from the shore to within 2 cables south-westward of the Porer rock lighthouse; in the middle of the ledge are two patches with 2 to 6 feet water, and elsewhere from 3 to 4 fathoms; and E.S.E. about  $1\frac{3}{4}$  cables from the islet is another 2-foot patch.

**Beacons**.—The shoal patches are marked by iron standards surmounted by two open discs placed crosswise and also by an iron flag; the discs and flags are white, the standards dark-coloured:—The first beacon, on the shoal nearest the Porer rock, is in about 5 feet water, with the lighthouse bearing W.  $\frac{1}{2}$  S.; the second beacon, on the shoal nearest to Felonoga islet, is in 9 feet; and the third beacon is in 5 feet, on the most projecting part of the shoal south-eastward of Felonoga islet.\*

\* These beacons with others on this coast, are occasionally carried away by the sea, and caution with reference to them is necessary.

Charts, 201 [793].  
200 [792].  
Lat. 44° 44' N.  
Long. 13° 54' E.  
Var. 8° 45' W.

**Sunk Rock (Pericolosa).**—This danger lies nearly  $1\frac{1}{2}$  miles S.  $\frac{3}{4}$  E. from Porer rock lighthouse and has 9 feet water on it. There are depths of  $5\frac{1}{2}$  and 7 fathoms close to on its southern and eastern sides; and immediately outside, deep water all round. Between this rock and Porer lighthouse, is a 5-fathoms patch, steep-to, 9 cables from the lighthouse.

These dangers are easily cleared by day, by cross bearings of cape Promontore and Porer rock lighthouse.

**Buoys.**—A buoy, painted white and black in horizontal stripes, and surmounted by a ball, is moored on the remains of the destroyed light structure of Sunk rock shoal.

Another buoy marks the northern edge of the shoal in a depth of 7 fathoms.

**At night,** from the westward, in standing towards cape Promontore or the land northward of it, Porer rock light should be kept in sight bearing eastward of S. 25° E.; and, in crossing the sector of red light shown over Sunk rock, Galiola islet light, should be kept eastward of E.  $\frac{1}{2}$  S. until Merlera point light (*fixed red*) is in sight, bearing N. 46° E.

Chart, 2,711 [798].  
Lat. 44° 47' N.  
Long. 13° 58' E.

**GULF OF MEDOLINO.**—This gulf is the small but deep inlet between cape Promontore and Merlera point; the distance between the two points is 4 miles, but, within, the gulf narrows considerably and extends more than 3 miles north-westward affording some well-sheltered anchorages. There are several islets and rocks in the gulf, which, as well as its shores are bordered by shallow water, rendering caution necessary in threading the way into the gulf. The best of the anchorages are the following:—

**Port Rosso** is about three-quarters of a mile north-westward from the eastern extreme of cape Promontore; it is a small bight protected from sea winds by Fenara and Cielo islets and rocks, and affords shelter to coasters; it has a depth of 3 fathoms, muddy bottom.

**Castello, Ronze, Medolino, and Pomer,** are small anchorages near the head of the gulf, also suitable to coasting vessels only. The passage to them is about 2 cables wide, and the depth from 3 to 4 fathoms.

Vessels occasionally anchor between Cielo and Trombola islets, in  $7\frac{1}{2}$  to 11 fathoms, good holding ground.

**Beacons.**—The following beacons mark the most dangerous reefs, and facilitate the navigation of the gulf of Medolino. On a reef between Fenara and Cielo islets, is a beacon consisting of an iron staff surmounted by an open ball and iron vane; it stands in 9 feet water.

On the shoal extending from the southern side of Cielo and at its south-eastern extreme in 3 feet water is a similar beacon; there is a 6-fathoms channel between these beacons.

On the shoal extending from the south-western shore of Cielo is another beacon of the same character, it also stands in 3 feet water; and, on the Sorico shoal 4 cables northward of the last named beacon, is another, like it in shape and in 3 feet water.

Vessels standing up the gulf pass between these two latter beacons.

On Castello point, near the Health office, close to the shore and but little above the sea level, is a white pyramid beacon of masonry 10 feet high.

**Directions.**—There are three channels to the anchorages in the gulf of Medolino; in taking either, the numerous rocks and shoals have to be carefully avoided. The first, which is usually preferred by vessels bound to Rosso, is between cape Promontore and Fenara islet. Mid-channel should be preserved by steering for Cielo, and, when the entrance to the

port opens out, the channel either between Solkovatz islet and the coast, or northward of this islet, but keeping it close aboard, should be taken, according to the direction of the wind. Chart, 2,711 [728].  
Var. 8° 45' W.

To proceed to the anchorage between Cielo and Trombola, 4 cables to the northward, the passage between Sta. Marina and Cielo islets is generally taken, and the anchor dropped northward of the latter. This channel presents no difficulty and should be used by vessels bound to the anchorages at the head of the gulf, as it is nearly a straight course.

If the channel leading to Rosso should be taken the shore should be avoided on arriving abreast of port Rosso, and a course steered between the south-west Cielo beacon and that marking the Sorico shoal, and then between Trombola and Cielo islets, after which the channel is open to proceed up the gulf as before.

There is also a channel between Sta. Marina islet and the northern shore, fit only for very small vessels; to clear the shoals on either side care should be taken to keep in mid-channel, where there is a depth of 2 fathoms on the shallow bar connecting the island with the shore.

No provisions or supplies of any sort are to be obtained at any of the little ports and anchorages in the gulf of Medolino. Even water fit for drinking is very scarce.

**MERLERA POINT**, on the western side of the entrance to Great Quarnero channel, 4 miles E.N.E. of cape Promontore, is 66 feet high, bare, and steep-to. Two islets, the Lievele grande and Lievele piccolo, lie a mile south-westward of it. There is a depth of 4 fathoms between the two islets, but between Lievele grande and the shore the water is shallow. Lat. 44° 48' N.  
Long. 14° 0' E.

**LIGHT**.—From a square stone tower connected with the keeper's dwelling, 75 yards from the shore of Merlera point and at an elevation of 70 feet above the sea, is exhibited a *fixed red* light, visible in clear weather from a distance of 12 miles, between the bearings N. 46° E., through north and west, to S. 15° W. The limit indicated by the first bearing leads 6 cables outside the south-eastern point of Fenara island and 8 cables south-eastward of Sunk rock.

---

General chart, 1,440 [789].

## CHAPTER V.

## QUARNERO GULF AND ISLANDS.

Chart, 2,711 [798].

**QUARNERO GULF.**—The waters of this extensive gulf wash the eastern coast of Istria on the one side, and the entire seaboard of Croatia, with part of the coast of Dalmatia, nearly as far as the town of Nona, on the other. It extends southward to Bianche point of Grossa island, and eastward to Ljubaz strait, which separates the southern end of Pago island from the coast of Dalmatia, and contains numerous islands, rocks, and shoals.

The larger islands in the gulf of Quarnero, as well as those on the coast of Dalmatia, are in communication with each other and with the mainland by means of telegraph cables, and it is necessary to avoid anchoring or fishing in their vicinity.

**The eastern coast of Istria** includes the space between Merlera point (page 127) and Fiume, an extent of about 45 miles, and presents mostly a wild and desolate appearance, consisting, as far as the eye can reach, of extensive forests with a few intervals of cultivated patches; the sides of monte Maggiore and the vicinity of Fiume are almost the only exception to these features. The high lands of Istria are chiefly on this side of the Peninsula and are ramifications of the Julian Alps. The range of monte Maggiore or Caldero, 4,580 feet high, being the most remarkable for the abruptness with which its eastern side rises from the midst of the hills branching from it, and which gradually decrease in height to the south.

Lat. 45° 17' N.  
Long. 14° 12' E.

The coast is generally rocky, precipitous, and of forbidding aspect; but there are no dangers at half a mile from it; among its indentations are a few narrow bays and inlets, but none suitable for large vessels.

In fine weather, the ebb and flow of the tidal wave are regular; at other times, the degree of irregularity, caused in a great measure by the channels among the numerous islands, depends on the force and direction of the wind.

The Bora is the wind most severely felt in this gulf, as well as on the western side of Istria, and scarcely a blade of grass grows on spots fully exposed to it; but it is the less dangerous to vessels, as it blows either off the shore or parallel with it. Strong south-easterly winds cause a considerable but not dangerous sea to roll in. The navigation of the gulf is therefore easy, and dangerous only from the frequent heavy gales. See Great Quarnero channel, pages 30 and 142.

**Aspect.**—The chief points of recognition, on approaching the Quarnero gulf from the south-eastward, are mount Ossero, 1,920 feet above the sea,\* near the northern end of Lussin island; afterwards monte Maggiore, and then cape Promontore and Porer rock lighthouse. Mount Ossero is easily recognised by its naked conical white top. Monte Maggiore, which rises above the surrounding mountains and is visible at a great distance, has a conical forked summit. Cape Promontore consists of a

\*Lat. 44° 40' N.  
Long. 14° 22' E.

number of low hillocks, mostly covered with bushes, which, in clear weather, are first seen on the horizon; a mile south-westward from it is the Porer rock lighthouse, as described in the preceding chapter. The summits of both Ossero and Maggiore are clouded shortly before and during sea winds, especially south-easters, and become clear suddenly at the cessation of them.

Chart, 2,711 [798].  
Var. 8° 40' W.

**Port Cuje** is a small inlet about  $1\frac{1}{4}$  miles northward of Merlera point, and is suitable for small vessels only. The point on the south side of entrance is shoal, and a reef of rocks extending nearly half a mile from the shore, of which Lakosase rock is just above water projects rather more than half way between Merlera point and the port, and is in the track of vessels bound to Cuje.

Lat. 44° 49' N.  
Long. 13° 56' E.

**Port Bado.**—Between port Cuje and Zuffo point, about 4 miles farther on, the coast is high, steep, and well-wooded. On the northern side of Zuffo point is port Bado, an inlet about  $1\frac{1}{2}$  miles in length and nearly a quarter of a mile in width, surrounded by high land; in almost every part of this port coasting vessels load with firewood. The depth is 24 or 25 fathoms in the entrance, but there is anchorage at the head of the bay, in 9 fathoms, mud. Water may be obtained.

Plan on chart  
2,711 [798].  
Lat. 44° 54' N.  
Long. 14° 0' E.

In entering port Bado, the high Zuffo point should be closed so as to avoid a rocky shoal extending  $1\frac{1}{2}$  cables southward from Forticcio point, the northern point of entrance; the shoal uncovers at low water.

**Vignole bay**, about 2 miles northward of port Bado, affords shelter to small vessels during westerly or northerly winds, but it is quite exposed to those from the southern and eastern quarters. A rock with 9 feet water lies in the middle of the entrance.

**ARSA CHANNEL** is a natural inlet, 6 miles in length and somewhat less than half a mile in breadth, with general depths of 6 to 20 fathoms; it receives the waters of the Arsa river, the source of which is lake Gessaro at the foot of monte Maggiore. There is good anchorage for vessels of moderate draught, which can ascend as far as Rupa cove. South-westerly winds send a sea into the entrance, which, however, is not felt beyond Castelvecchio, 2 miles within the entrance.

Lat. 44° 57' N.  
Long. 14° 3' E.

Vessels may anchor on both sides of the inlet, but as the depth increases rapidly towards the middle, Bora squalls would in all probability cause the anchor to drag considerably before bringing up, and it is therefore advisable to lay out an anchor to the north-eastward. Vessels anchoring should prefer the eastern shore.

Port Carnizza is an inlet on the western shore at the entrance to the Arsa channel; it is surrounded by high land and has a depth of about  $5\frac{1}{2}$  fathoms, muddy bottom. It is seldom visited except by large boats to load with firewood. The best berth is off the village. Water may be obtained at the upper part of the inlet.

Port Gradaz is an indentation of the land 2 miles above the entrance on the eastern side of Arsa channel and is the best harbour in the inlet; it has a depth from 10 to 18 fathoms. Mount Ubas, 298 feet high, the shore of which forms the southern side of port Gradaz, serves to indicate the entrance to the Arsa channel or inlet; it is a tongue of land covered with wood, of whitish appearance near the sea, and terminates southward in point Ubas, on which stands a lighthouse.

**Coal wharves.**—In Vagna bay, situated 6 cables northward of Rupa cove, in Arsa channel, are three wooden moles for coaling purposes; the deep channel to the bay is marked by stakes. There is a mooring buoy off the coal wharves.

Chart, 2,711 [798].  
Var. 8° 40' W.

**LIGHT.**—At Ubas point, on the western side of the Great Quarnero channel, but forming the eastern point of entrance to the Arsa channel, stands a square three-storied lighthouse, from which, at the respective elevations of 73 and 44 feet above the sea, are exhibited *two fixed white lights*, placed vertically, and visible in clear weather from a distance of 10 miles, when bearing from N. 81° W., through north, to S. 13° W.

Lat. 44° 58' N.  
Long. 14° 9' E.

**Nera point**, 3½ miles eastward of Ubas point, is of considerable height, thickly wooded, and visible at a considerable distance, as is also mount Goly, 1,761 feet high, of which it is a spur. Between Ubas and Nera points are the two small bays of Koromacna and Voschizza, both open to the southward, but sheltered from northerly winds between W.N.W. and E.N.E.

A vessel should not anchor nearer the shore than in a depth of 11 fathoms, in order to avoid rocky bottom, especially in Koromacna, the westernmost of the two bays. There is a mooring buoy in Voschizza bay.

**LIGHT.**—On Nera point, from a lantern at the corner of a stone dwelling, 23 feet high, a *fixed white light*, elevated 48 feet above the sea, is exhibited, visible in clear weather from a distance of 11 miles when bearing from S. 67° E., through east and north, to S. 74° W.; between S. 67° E. and S. 82° E. the light has diminished power.

**Port Lungo**, about 5 miles northward of Nera point, is an inlet more than a mile deep, open to the southward, with a depth of 22 fathoms at its entrance, decreasing to 8 fathoms at its head, good holding ground. The inlet is too narrow to be entered except by small vessels. Southerly and south-easterly winds send in a heavy sea, and it is necessary to secure to the weather shore against the violent Bora squalls. There are no villages here.

Plan on chart,  
2,711 [789].  
Lat. 45° 4' N.  
Long. 14° 10' E.

**PORT RABAZ**, about 2 miles north of port Lungo, is a bay about half a mile deep and 3 cables wide; it affords shelter to coasters from westerly and northerly winds, and the holding ground is good. Southerly and south-easterly winds are severely felt, and the Bora reaches the bay in violent gusts. There are a few houses on the beach. This anchorage serves as a port to the ancient town of Albona, standing on an eminence about 1½ miles westward of it.

A rocky shoal, with 4 feet least water, extends about a cable from St. Giorgio point, on the southern side of entrance to the bay. There are two mooring buoys off the houses at the head of the bay.

Water may be obtained in abundance at a spring.

**Telegraph.**—There is a telegraph station at port Rabaz.

**LIGHT.**—On St. Andrea point, at the eastern side of entrance to port Rabaz, is a turret on a dwelling, from which is exhibited at an elevation of 34 feet above the sea, a *fixed red light*, visible in clear weather from a distance of 7 miles.

A lifeboat is stationed at port Rabaz.

**COAST.**—**Fianona bay**, situated 3 miles northward of port Rabaz, is about 3 cables wide at the entrance, gradually narrows to its head, and extends nearly 2 miles in a north-westerly direction. The depths in it are 27 fathoms at the entrance, decreasing to 4 fathoms, muddy bottom, at the upper and narrower part, where the village of Fianona stands on a hill, the site of the ancient town of this name.

The inlet is open to the south-east and is visited by heavy Bora squalls, against which it is customary to secure by laying out cables to the shore.

Lat. 45° 7' N.  
Long. 14° 12' E.  
Chart, 2,711 [789].

Fianona and Rabaz are the two chief places of export for the produce of the eastern side of the Istrian peninsula. From seaward, Fianona bay appears like a deep cutting in the mountains. Chart, 2,711 [798].  
Var. 8° 40' W.

Water is plentiful and provisions may be procured.

**FARASINA CHANNEL.**—One mile northward of Fianona bay, Prestenizze point, the western extreme of the northern part of Cherso island approaches the Istrian shore within less than 2½ miles, forming a strait, which is the narrowest part of the passage connecting the Great Quarnero channel with the gulf of Fiume, and which takes its name from the village and cove of Farasina, in Cherso island. For the description of the light on Prestenizze point, *see* page 136. Lat. 45° 8' N.  
Long. 14° 15' E.

**Coast.**—Between Fianona and port Priluka, at the head of Fiume gulf, a distance of about 15 miles, the coast presents a less desolate appearance than that to the southward. A few villages and patches of cultivation are visible, especially on the slope of monte Maggiore and in the neighbourhood of Fiume. The coast is almost everywhere high, abrupt, bordered by deep water, and without any shelter, except a few little boat creeks protected by moles, and the small ports of Ika, Abbazia, Volosca, and Priluka, all within 3½ miles of the northern extreme of the gulf of Fiume.

**Telegraph cables.**—A telegraph cable is laid from Mazar cove, about 1½ miles northward of Fianona inlet, to about half a mile northward of Farasina cove,\* in Cherso; both shore ends are marked by turrets, and vessels are cautioned as to anchoring in this vicinity. \*Lat. 45° 8' N.  
Long. 14° 18' E.

Cables are also laid from the Istrian shore to the same landing place in Cherso, from Stupova cove, one mile northward of Mazar cove, and from another station about midway between these coves. *See* also page 136.

**LIGHTS.**—**Ika.**—At the little port of Ika, about 3½ miles southward of port Priluka, a *fixed white* light, visible in clear weather from a distance of 3 miles, is exhibited from an iron column, at an elevation of 38 feet above the sea. The light shows seaward over an arc of 160°.

There is a funnel-shaped hole of about 18 fathoms, or probably greater depth about three-quarters of a cable from the light structure, in which vessels are liable to foul their anchors.

**At Lovrana,** on the head of the landing pier, a *fixed green* light is exhibited from an iron column, at a height of 20 feet, visible one mile. During north-east gales it cannot be exhibited.

**Abbazia.**—From the mole-head of Abbazia, 2½ miles northward of Ika, is exhibited a *fixed green* light, elevated 18 feet above the sea, visible 3 miles. Lat. 45° 20' N.  
Long. 14° 19' E.

A mooring buoy is laid out eastward of the molehead, from which Abbazia church bears N. 29° E., and a tall chimney, upper part black, lower white, N. 49° W., distant 2½ cables.

**Caution.**—At Abbazia, and also at Lovrana, about 3 miles south-westward, harbour works are in progress, and steam vessels passing near those places should proceed at moderate speed to avoid damage.

**Volosca.**—At Volosca, between Abbazia and Priluka, a *fixed* light elevated 18 feet above the sea, is exhibited from an iron standard on the new mole head. The light shows *red* when bearing from N. 22° E., through north, to N. 68° W.; *white* elsewhere; and is visible 3 miles.

A small *white* light is also shown from a post at the extreme of the mole extension.

**Port Priluka** is a small open bay only sufficiently large for a few coasters. Its position in the extreme northern part of the gulf of Fiume is unmistakable, and is further indicated by the town of Castua, about 1½ miles inland, near which is a white castle on an eminence.

Plan of Fiume,  
1,996 [799].  
Lat. 45° 20' N.  
Long. 14° 26' E.  
Var. 8° 30' W.

**FIUME** (Illyrian, *Reka*), one of the most important commercial towns in the Adriatic, is the only port of Hungary and the chief outlet for its produce; consequently it is of considerable importance. Extending about two miles along the sea-side, its sea face bordered by quays, and containing several imposing edifices, with high land in the background, it presents a picturesque appearance.

**Population.**—The estimated population of the town in 1906 was 39,000, with 4,600 more belonging to the district, the whole being under the administration of a civil governor. Hungarian is the official language since its annexation to that kingdom in 1867, but Italian is the language chiefly in use.

**Communication.**—It is in railway communication with Trieste, Vienna, and Buda-Pesth, the railway station being close to the shore, with sidings to the various wharves. A good road is carried over the Julian Alps to Carlstadt, where the navigation of the Save and Culpa becomes available.

The steamers of the Austro-Hungarian Lloyd's Company keep up constant communication with the Levantine ports; the Anchor line, with New York; and there are many steamers constantly running between Fiume and the principal English ports.

**Trade.—Shipping.**—The local industries of Fiume, in addition to a tolerably active shipbuilding interest, are the famous paper mills of Messrs. Smith and Meynier, and an extensive chemical factory. Whitehead's torpedo factory is at the western end of the town and may be known by two small jetties; the machinery can turn out about 300 torpedoes per annum. The petroleum port, not allowed to be entered at night and which is protected by a mole, is eastward of the torpedo works.

The number of vessels that entered the port in 1906 was 12,637, amounting to 2,386,000 tons, of which 1,778 were sailing vessels of 83,000 total tonnage. The chief imports are petroleum, rice, coal, coffee, jute, maize, &c. The exports are, flour, wheat, barley, sugar, prunes, beans, manganese ore, lumber, &c. The value of the imports in 1905 amounted to about 5,047,000*l.*; the exports, to 7,500,000*l.* Tobacco, salt, and gunpowder are government monopoly and not allowed to be imported at all. Wine and spirits are subject to octroi. All other articles are at present free of duty.

**Coal and Supplies.**—About 6,000 to 7,000 tons of coal are usually in stock at Fiume, and there is a coal wharf, 1,500 feet in length, at which there is a depth of 30 feet alongside.

Provisions of all kinds are good and plentiful.

Water is brought to the quay in a pipe, and runs out in a clear cold stream at a height of 5 or 6 feet above the sea, so that a boat of any size may lie under it. The place is convenient, being close to the landing place inside the mole.

**Consulate.**—There is a British Consul at Fiume.

**Hospital.**—There is a hospital here, which is available for seamen if required.

**Repairs** of any description can be effected, except large castings and rollings.

**THE PORT of Fiume** is formed by a breakwater named Maria Teresa mole, extending from the eastern part of the town in a general W.N.W. direction, and enclosing an area about 9 cables in length, by 1½ cables in width at the entrance (including works in progress) to 1¼ cables at the head or eastern end of the port, with depths of from 9 to 21 fathoms, muddy bottom.

**Moles.—Petroleum basin.**—Within the port are five transverse moles, the Daniel, Adamich, Zichy, Rudolf and Marie Valerie. At about 2 cables from the latter, the outer completed mole of the five, a new mole is under construction; it will extend from the shore within the head of the extended part of the Maria Teresa mole, and the channel between it and the mole will be  $1\frac{1}{2}$  cables in width.

Plan of Fiume  
1,996 [790].  
Lat.  $45^{\circ} 20' N.$   
Long.  $14^{\circ} 26' E.$   
Var.  $8^{\circ} 30' W.$

**Mooring buoys.**—There are a number of mooring buoys in the port, in addition to four outside the mole head, and one buoy off the entrance of the Petroleum basin; the mooring buoys are reported as unfit for heavy vessels. The extension of the mole, and the new transverse mole constructing, are marked by buoys; steam-vessels must pass well clear of the buoys, and with reduced speed.

**Bergudi harbour,** about 2 cables westward of the torpedo works, is formed by a mole projecting about 500 yards in a westerly direction, and with a pier northward of it jutting out in the same direction, in which steam-vessels with a draught of 26 feet can be accommodated; there is a mooring buoy off the entrance.

Two practice targets are moored off the entrance to Bergudi harbour at N.  $87^{\circ} W.$  1,094 and 2,188 yards, respectively, from the Torpedo works pier; also a floating stage at 1,640 yards in the same direction.

**Gabriel Baross harbour.**—Close southward of the eastern end of port Fiume is Gabriel Baross harbour, 2 cables in length, east and west, by one cable in breadth, with a depth of 10 fathoms over the greater part. Just east of this port lies the mouth of the river Reka or Recina.

Three mooring buoys lie West, S.W., and South respectively, from the mole head of this harbour.

**A conspicuous object** in approaching Fiume from the southward, is the Marine Academy, a large square stone building having a red tiled roof, standing within the western part of the breakwater; it is surrounded by trees, and may be easily recognised by the great number of windows in it. Another conspicuous object is a large grain elevator, the upper part of which is grey zinc; it is the western of the two buildings on the Riva Francesco Salvatore. Mount Drenova, 2 miles northward of the town, is also a good distant mark.

**LIGHTS.**—Near the west end of the town, about 200 yards from the beach, and nearly abreast the extreme of the outer breakwater, stands a grey cylindrical iron tower 91 feet high, from which, at an elevation of 101 feet above the sea, is exhibited a *fixed* and *flashing* electric light with a period of *thirty seconds*, thus:—*Fixed*, *twenty-nine seconds*; *flash*, *one second*. The light shows *white* when bearing east of N.  $16^{\circ} E.$ , and *red* when bearing westward of N.  $16^{\circ} E.$ ; it is visible in clear weather from a distance of 17 miles.

**Maria Teresa mole.**—A *fixed red* electric light is exhibited from an iron standard over a small house on the extremity of Maria Teresa mole (in progress), visible only when bearing southward of S.  $78^{\circ} E.$

**Light-vessel.**—From a light-vessel moored about  $1\frac{9}{10}$  cables N.  $78^{\circ} W.$  from Teresa mole head, in the direction of the extension works, two *fixed red* vertical lights are exhibited, visible at the distance of about one mile. Vessels are prohibited from passing between the light-vessel and mole head.

**Bergudi harbour.**—From an iron column on the end of Bergudi inner pier, a *fixed white* light is exhibited, elevated 16 feet above the sea, visible in clear weather from a distance of 6 miles.

**Petroleum port.**—A *fixed green* electric light, elevated 26 feet above the sea, is exhibited from the Petroleum port mole head, visible 3 miles.

Plan of Fiume,  
1,996 [799].  
Lat. 45° 20' N.  
Long. 14° 26' E.  
Var. 8° 30' W.

**Marie Valerie mole.**—From an iron column on the outer extreme of Marie Valerie mole a *fixed* electric light is exhibited at an elevation of 35 feet above the sea, showing *green* when bearing from S. 54° E., through east and south, to N. 54° W.; *white* elsewhere; visible one mile.

A *red* light is shown from a pole at the end of the new mole building about 2 cables westward of Marie Valerie mole.

**Rudolf mole.**—From iron columns on the N.W. and S.E. extremes of Rudolf molehead, at 35 feet above the sea, are shown *fixed white and green* lights.

**Zichy mole.**—From iron columns on the N.W. and S.E. extremes of Zichy molehead, at 35 feet above the sea, are exhibited *fixed white and green* lights.

**Adamich mole.**—On the head of the Adamich mole is exhibited a *fixed white and green* light, elevated 31 feet above the sea.

Rudolf, Zichy, and Adamich mole lights are electric, visible one mile, and show *green* seaward, *white* towards the town. Should the electricity fail, other lights of similar character will be shown.

**Gabriel Baross.**—From the west extremity of the breakwater a *fixed red* light, visible 3 miles, is exhibited from an iron pillar 52 feet high, with red ball, and on either side of the entrance a *fixed green* light, elevated 13 feet, is shown.

**Directions. — Anchorage.**—There are no dangers in the approach to Fiume; vessels should not enter the port of Fiume at night without a pilot, but should bring up in the road. Large vessels should anchor off the port in a depth of from 20 to 24 fathoms, about three-quarters of a mile from the town, good holding ground.

Although the fetch in the gulf of Fiume is not more than 10 or 11 miles in any direction, a heavy sea is sent in by winds from the southward when they blow directly through the passage between Cherso and Veglia islands.

**Tides.**—It is high water, full and change, at Fiume, at 8h. 36m.; the rise is 1½ feet.

**Time signal.**—On an iron framework erected on a low square tower situated near the middle of Maria Teresa mole, a black ball is hoisted 5 minutes before signal, and dropped by electricity from the Naval Academy at the instant of noon mean time of the meridian of long. 15° E. corresponding to 23h. 0m. Os. of Greenwich mean time; a gun is fired simultaneously. When signal fails in accuracy, the ball is immediately hoisted half way up, and kept so for some time.

**Port Martinscica** about 1½ miles south-eastward of Fiume (shown on the same plan), of which it is the quarantine port, is an inlet nearly 4 cables deep and about 1½ cables wide; the soundings decrease from 17 fathoms at the entrance to 7 fathoms at its upper part. Vessels moor along the eastern shore on account of the Bora. Small supplies may be obtained close to the beach. Shipbuilding is carried on here.

The entrance is easily recognised by the high point on the southern side, and by a hill with a small chapel on its summit.

**PORTO RE** is about 6 miles south-eastward of Fiume on the eastern side of, and in the entrance to Buccari bay, just within Ostro point. It is about 3½ cables in extent and little more than a cable wide, and is sheltered from all but north-westerly winds, which send in a considerable sea; the depth in the middle is about 12 fathoms, mud, and good holding ground.

Ostro point is surrounded by a rocky shoal extending about a cable. There is a mooring buoy a short distance within the entrance points. Water is with difficulty procured and provisions are scarce at the town, which is at the head of the port, and contains 1,100 inhabitants.

Plan on chart,  
2,711 [798].  
Lat. 45° 16' N.  
Long. 14° 34' E.

**LIGHTS.**—On Ostro point at the south-western side of the entrance to Porto Re, is a circular lighthouse 46 feet in height and painted with red and white horizontal bands, from which is exhibited at an elevation of 50 feet above the sea, a *fixed white* light varied by a *flash of three seconds* duration every *three minutes*; it is visible in clear weather from a distance of 12 miles.

Chart, 2,711 [798].  
Var. 8° 30' W.

Two small lights are shown from lamp-posts on the landing pier in Porto Re; one is *fixed red*, the other *fixed green*; they are elevated 13 feet above the sea, and are visible one mile.

**Telegraph.**—There is a telegraph station at Porto Re.

**Supplies.**—Provisions are plentiful. Water is said to be very good and is obtained free from the stream supplying the town.

**BUCCARI BAY.**—This bay would be more correctly described as a landlocked basin  $2\frac{1}{2}$  miles in length north-west and south-east, and from  $2\frac{1}{2}$  to  $4\frac{1}{2}$  cables in width; it is surrounded by bold shores and has depths of from 12 to 20 fathoms, with, consequently, accommodation for a considerable number of vessels of any size.

Plan on chart,  
2,711 [798].  
Lat. 45° 18' N.  
Long. 14° 33' E.

**The town** of Buccari, with 2,300 inhabitants, stands on the shore at the north-western end of the bay and communicates with Fiume by a good road and also by railway, the line from Fiume to Agram and Buda-Pesth passing inland at Buccari.

There is a mooring buoy off a small quay on the western shore about  $5\frac{1}{2}$  cables S.S.E. from the harbour light.

The village and bay of Buccarizza are at the south-eastern end of the basin. The anchorage is off the town of Buccari, in 12 to 15 fathoms, mud, where vessels are best sheltered from the Bora, which at times reaches the anchorage suddenly and with great strength. Water is abundant and provisions may be obtained.

**Harbour light.**—A *fixed red* light, visible 2 miles, is shown from a lamp-post on a small mole at the northern side of Buccari anchorage.

The fort on the south-east side of the entrance to Buccari bay, which also commands Porto Re, may be seen from a long distance. On the western shore of the approach to the entrance is a 5-fathoms patch, about a cable from the shore and  $2\frac{3}{4}$  cables W. by S.  $\frac{1}{2}$  S. from Sercica point. The entrance to the bay is open to the south-west, and, with the exception of the patch named, and of the shoal around Ostro point on the opposite side, the entrance, which narrows at the inner points to  $1\frac{3}{4}$  cables, is deep and the shores bold.

For the southern approach to Buccari bay or to Fiume by the Maltempo channel, see page 148.

**CHERSO ISLAND.**—The passage between this island and the coast of Istria is the widest of the Quarnero passages and is known as the great Quarnero channel.

Chart, 2,711 [798].

The island of Cherso is 35 miles in length north and south, very irregular in shape, its greatest breadth near the middle being only  $6\frac{1}{2}$  miles; from thence northward it narrows to  $1\frac{1}{4}$  miles, becoming wider again towards the northern end.\* Its shores, except the northern portion, are somewhat broken, forming several small bays and inlets, as well as the large bay of Cherso on the western side of the island; the coast is more or less high and rugged, but somewhat lower near the southern extreme. The eastern side has few inhabitants, and the extensive forests and barren wastes on that side are only occasionally interrupted by houses and patches of cultivated ground.

\*Lat. 45° 10' N.  
Long. 14° 20' E.

The western side has a less desolate appearance; towards the northern end it is high and studded with villages. The soundings are generally deep within 2 or 3 cables of the shore, and, except a few shoals presently described,

General chart, 1,440 [789].

Chart, 2,711 [798].  
Var. 8° 35' W.

\*Lat. 44° 53' N.  
Long. 14° 24' E.

there are no obstacles to navigation for vessels of deep draught. The highest point is mount Syss, which rises 2,090 feet above the sea, near the narrowest part of the island and about  $6\frac{1}{2}$  miles from its northern end, whilst northward and southward of it are mountains of less height; in the centre of the island is mount Perska,\* 1,406 feet high, over the head of Cherso bay; and, at the western foot of this mountain, in the middle of the island, is lake Vrana, 3 miles in length and three-quarters of a mile wide.

It is inadvisable to sail near the eastern shore of Cherso on account of the Bora; the opposite side of the island is sheltered from this wind and has several ports and safe anchorages. Strangers may take warning of a coming Bora by observing all the small craft hastening to the nearest places of shelter.

Lat. 45° 8' N.  
Long. 14° 18' E.

**Farasina.**—**Telegraph cables.**—The village and cove of Farasina are about a mile northward of Prestenizze point, the western extreme of Cherso; the shore end of the telegraph cables, already mentioned at page 131, half a mile northward of this cove, is marked by a turret, and in Mazar cove in Istria its shore end is similarly marked; other cables run from this landing place to Stupova cove, and to a spot midway between it and Mazar cove; care should be taken not to foul them. A telegraph cable also connects the island of Cherso with Grego Morte cove, Veglia island; and, another, with the island of Lussin.

**LIGHT.**—On Prestenizze point is a two-storey building, 45 feet in height, from which is exhibited, at an elevation of 56 feet above the sea, a *fixed white light varied by a red flash of twenty seconds* duration every *two minutes*, visible in clear weather from a distance of 13 miles. This is the narrowest part of the channel leading to the gulf of Fiume, Prestenizze point being less than  $2\frac{1}{2}$  miles from the coast of Istria.

Lat. 44° 57' N.  
Long. 14° 19' E.

**Pernata point** is about 7 miles eastward of Nera point on the coast of Istria, and forms the western horn of Cherso bay; it is bold, elevated, and one of the most remarkable points on the island, the land  $1\frac{1}{2}$  miles southward of it being 1,116 feet high.

**ZAGLAVA ROCK** rises from a shoal nearly 2 cables in extent situated S.W.  $\frac{1}{2}$  S. distant  $2\frac{1}{10}$  miles from Pernata point and about half a mile from Cherso island, with a depth of 30 fathoms between it and the shore, and 7 fathoms half a mile south-westward of it.

**LIGHT.**—On Zaglava rock is a square light-tower above the light-keeper's two-storey dwelling, 49 feet high, from which is exhibited, at an elevation of 65 feet above the sea, a *fixed white light varied by a flash of three seconds* duration, once *every minute*, visible in clear weather from a distance of 14 miles.

**CHERSO BAY.**—This bay is about  $3\frac{1}{4}$  miles wide at its entrance between Pernata point and St. Biagio point north-eastward of it; from this line, the bay extends southward nearly 5 miles and is protected from all but northerly winds. Vessels may anchor above the middle of the bay, at 2 or 3 cables from the eastern shore, in depths of 26 to 28 fathoms, good holding ground.

Plan on 1,561  
[800].  
Lat. 44° 57' N.  
Long. 14° 23' E.

**PORT CHERSO.**—This inlet on the eastern shore of Cherso bay, is about  $1\frac{1}{2}$  miles in extent, and, at about half way in, is 2 cables in breadth; it then expands forming a basin 4 cables wide, which, though small, is an excellent port. The water at the entrance is deep, but off the town of Cherso, on the north-eastern side of the basin, it ranges from 8 to 10 fathoms, mud bottom. The best berth is abreast of the San Benedetto convent

southward of the town; small vessels anchor nearer the shore, to which they secure against the Bora. Plan of Cherso, on  
1,561 [800].  
Var. 8° 35' W.

**A mole**, about 166 yards in length, projects westward from the shore northward of the Health office, alongside which there is reported to be a depth of 16 feet; a buoy lies off its extremity. There is a small natural basin, around which the town is built, capable of receiving small craft.

**The town** of Cherso contains about 4,500 inhabitants. There is a spring of fresh water south-eastward of the town and provisions are procurable. There are also yards for the repair of coasting vessels.

**LIGHTS.**—At Kovacine or Zacca point, on the northern side of entrance to port Cherso, is an iron pillar on the extremity of a short mole from which is exhibited, at an elevation of 24 feet above the sea, a *fixed white* light, visible in clear weather from a distance of 10 miles.

In entering the port, this light becomes obscured northward of N. 55° W. or in the direction of a line passing nearly a cable southward of Molino point, in order to clear the shoal off that point.

**At Molino point** in port Cherso, a little south-westward of the town, a small *fixed white* light, visible 2 miles, is shown from a red iron support at an elevation of 18 feet above the sea.

**On New mole head**, 2½ cables eastward of Molino point, a *fixed* light, showing *red* seaward and *white* over the town, elevated 19 feet above the sea, and visible 2 miles, is exhibited from an iron support.

**Telegraph.**—There is a telegraph station at port Cherso.

**COAST.**—**Port St. Martino** is a bay 7 miles southward of Zaglava lighthouse and open to the southward; a considerable swell sets in with south-westerly winds. The best anchorage for small vessels is in a depth of 10 to 13 feet, mud, abreast a monastery which is visible from some distance. The bay is somewhat protected from the south-westward by Levrera island. The passage into port St. Martino northward of Levrera is about 1½ miles wide and clear of danger. Chart, 2,711 [798].  
Lat. 44° 49' N.  
Long. 14° 21' E.

**Light.**—A *fixed red* light, elevated 18 feet above the sea, is exhibited from the Mole head at St. Martino, and should be visible in clear weather from a distance of 5 miles, between the bearings of N. 22° E., through north, to N. 37° W.; it may not be lighted in northerly gales.

**Levrera island** is about 2 miles in length north and south, half a mile in breadth, and, towards the southern end, 220 feet high. Both sides of the island are bordered by rocks and shallow water, which extend some distance off-shore. Between it and the coast of Cherso is the small islet of Visoki, nearly round, 24 feet high, and, except on its north-western side, surrounded by shallow water. About a quarter of a mile north-westward of Visoki is a 7-fathoms patch, and 8½ cables N. by W. from the east point of the islet a shoal with a depth of 5 fathoms.

**OSSERO CHANNEL** is the space between the north-eastern shore of Lussin island and the coast of Cherso, which, northward of the narrows at Ossero, takes the name of Vier bay. This bay affords good anchorage for vessels of any size in depths of 24 to 27 fathoms. The anchorage is a mile northward of the town, or farther southward, hard mud. Lat. 44° 44' N.  
Long. 14° 21' E.

In entering Ossero channel, the rock off Ossero point, the northern extreme of Lussin, must be given a berth.

Chart, 2,711 [798].  
Var. 8° 35' W.

A beacon, painted white, surmounted by an open ball, 21 feet high, marks the northern end of the shoal off Ossero point.

Ossero channel leads to Lussin channel, page 144.

Lat. 44° 42' N.  
Long. 14° 23' E.

**The town** of Ossero, ancient *Absorus*, stands on an eminence on Cherso island close to Lussin island, and an iron swing bridge connects the two. The channel between is named the Cavanella; it is only about 23 feet wide abreast the town of Ossero, with a depth of little more than 6 feet, but is available for small craft. A fort defends it. The two shores gradually diverge southward of the narrows, to the southern entrance, which is about 3 miles wide. At Ossero, the beautiful white limestone so largely employed at Venice is quarried. Water and provisions are scarce.

**Telegraph.**—Ossero is a telegraph station.

**LIGHT.**—On the north point of entrance to Ossero a *fixed red* light is exhibited at an elevation of 18 feet above the sea, visible in clear weather from a distance of 6 miles, between the bearings S. 9° W., through south and east, to N. 58° W.

Lat. 44° 45' N.  
Long. 14° 23' E.

**Camisa bay** is in the northern approach to Ossero channel, on the coast of Cherso, and nearly 3 miles northward of Ossero town. The water is deep, but there is anchorage for small vessels in the northern part of the bay in about 7 fathoms, muddy bottom.

**LUSSIN ISLAND. — Aspect.**—Lussin island consists of mountainous heights united by low isthmuses, and, at a distance, presents the appearance of three islands. It is 16½ miles in length north-north-west and south-south-east, and its breadth varies from about half a mile to nearly 3 miles, its coast line being generally high, broken, and irregular, and the water deep around it. The northern part is hilly and barren, and nearly 3 miles from this end is mount Ossero,\* cone shaped and rising 1,920 feet above the sea; it is one of the most remarkable objects in this part of the Adriatic. Mount Calvario, 745 feet high, with a church on its summit, is in the southern part of the island, which part is well cultivated and contains the greater portion of the 12,000 inhabitants of the whole island. Here, many flocks, the wool of which is exported, find pasture, and the vine and olive are grown in abundance.

\*Lat. 44° 40' N.  
Long. 14° 22' E.

**Ossero point**, the north extreme of Lussin island, is mentioned above. The bold coast of the island from thence trends southward, with deep water off it, for nearly 7½ miles to Carbarus islet or rock, which is connected with the shore by shallow water; from thence, southward round Gorila point, the south-western extreme of Lussin, it is bordered by a narrow bank. Bianca point, a mile south-eastward of Kurila point, is bold, and 1½ miles farther eastward is the entrance to port Lussin Piccolo.

Plan on 1,561  
[800].  
Lat. 44° 33' N.  
Long. 14° 25' E.

**PORT LUSSIN PICCOLO** is a long narrow inlet at the lowest and narrowest part of the island; the entrance, bearing about E. by N. ¼ N. distant 6 miles from the lighthouse on Sansego island, is faced by Fort Asino (in ruins), on a hill 410 feet above the sea; see view on plan.

The port, about 3 cables wide, with depths of 11 to 18 fathoms in the entrance, extends nearly 3 miles north-west and south-east, has no hidden dangers, and is considered one of the best and most convenient harbours in the northern part of the Adriatic. Vessels anchor in any part of the inlet, in depths of from 6 to 23 fathoms, good holding ground, but the north-eastern side, not far from the outer houses of the town, is usually preferred on account of its being better sheltered from the Bora. There is

also anchorage in the north-western part of the inlet. The rocky north-eastern shore of Koludarc islet, and also the north-eastern shore of the port abreast the outer houses of the town, should not be approached too closely. Plan on 1,561  
(800).  
Var. 8° 35' W.

Two mooring buoys are placed on the eastern side of the harbour near the town and other two at the head of the bay. There are also ten warping bollards along the eastern shore.

**The town** of Lussin Piccolo, at the south-eastern end of the inlet, contains a population of about 5,000. There is very little cultivation in the vicinity, and what there is requires the protection of numerous stone walls, as the Bora blows frequently with great violence during the winter months. There are building yards for small vessels, the wood being brought from the coast of Dalmatia and elsewhere. The tender "Lissa" stationed here, is available for salvage purposes. Lat. 44° 32' N.  
Long. 14° 28' E.

**Communication.**—Steamers call three times a week with the mails to and from Trieste, Corfu, &c.

**Supplies.**—Water and small supplies of provisions may be obtained.

**Telegraph cables.**—The town is connected by telegraph cable with Sansego island, Selve island, and with Cherso, thence with the Istrian peninsula.

**A storm signal** station is established on mount Velo Straza, about three-quarters of a mile north-westward of the town.

**Time signal.**—A time signal is made at the south-western extreme of the quay fronting the square. It consists of two black discs hoisted vertically on a pole; these fall into a horizontal position at mean noon of the meridian of long. 15° E., equivalent to 23h. 0m. 0s. Greenwich mean time. Signal not made on Sundays and holidays. Lat. 44° 31' 49" N.  
Long. 14° 28' 6" E.

**LIGHTS.**—At the western end of Mortar islet, on the southern side of the Bocca Grande or passage into port Lussin Piccolo, is a *fixed* light elevated 33 feet above the sea, exhibited from an iron column surmounted by a red and white globe, on the keeper's dwelling. The light shows *red* when bearing from N. 21° W., through north, to N. 66° E.; *white* from N. 66° E., through east, to S. 23° E.; obscured elsewhere; *white* light visible in clear weather from a distance of 11 miles, *red* light at 8 miles. See views on chart, No. 2,711, and plan 1,561.

At **Sta. Croce point**, the north extreme of Koludarc islet, on the southern side of entrance to port Lussin Piccolo, is exhibited from a grey wooden post on masonry base, a *fixed green* light, elevated 33 feet above the sea, and visible 2 miles, when bearing from N. 53° E., through east, to N. 37° W. Lat. 44° 32' N.  
Long. 14° 28' E.

On Poljana point, about 6 cables S. 56° E. from Sta. Croce point light, upon a construction painted green, two vertical *fixed white* lights are exhibited, 26 and 19 feet above the sea, respectively, visible 4 miles, when bearing from S. 38° E., through east, to N. 38° W.

Two *fixed red* lights, are shown at the town of Lussin Piccolo, one at each end of the landing place; they are elevated 18 feet above the sea, and are visible at the distance of 2 miles.

**Tides.**—It is high water, full and change, at port Lussin Piccolo, at 8h. 26m.; the rise is about one foot.

**Directions.**—When bound to Lussin Piccolo, the lowest part of Lussin island should be steered for, and, on a near approach, the town, which is on an eminence at the south-eastern end of the port, will be plainly seen. The Bocca Grande, the channel between Zabodacki (65 feet high) and Mortar islets, is free from dangers; the entrance to the port,

Plan on 1,561  
[800].  
Var. 8° 35' W.

is about 2 cables wide between the bluff Torunza point and the north-western extreme of Koludarc islet, both of which are foul to a short distance and should be rounded at the distance of a cable, after which a course may be steered direct for the town.

Mortar islet is connected with Koludarc islet by a bank covered with one to 2 fathoms water. The narrow space between the south-eastern extreme of Koludarc islet and the point of Lussin island, which forms the port, is called the Bocca Falsa, or false entrance, and only admits boats, being closed by a reef of rocks.

**Artatorre cove.**—Temporary anchorage may be obtained in Artatorre cove on the north side of Bocca Grande, when the Bora prevents entrance to Lussin Piccolo. But care must be taken to quit it before being detained by southerly winds, to which it is quite exposed.

Lat. 44° 34' N.  
Long. 14° 24' E.

**Port Cigale**, situated 2 miles south of the entrance to port Lussin Piccolo, is a well-sheltered inlet about half a mile deep, frequented by coasting vessels; its entrance, which is not quite  $1\frac{1}{2}$  cables wide, is between points Cigale and Madonna or Annunziata and is open to westerly winds. The depth is from 9 to 12 fathoms in the middle of the port. There is a Health office here and the distance across by land to Lussin Piccolo is only about half a mile. There is a chapel on Annunziata point.

**Light.**—At Madonna or Annunziata point, on the southern side of entrance to port Cigale, a *fixed green* light is exhibited from a green iron post, at an elevation of 35 feet above the sea, visible in clear weather from a distance of 5 miles, when bearing from S. 14° E., through east, to N. 14° W.

Chart, 2,711 [798].

**UNIE ISLAND** is the westernmost of the Quarnero islands; between it and the coast of Lussin is a deep channel from  $2\frac{1}{4}$  to  $3\frac{1}{2}$  miles wide. The island is 5 miles in length, north and south, from half a mile to  $1\frac{1}{2}$  miles in width, and of irregular shape; its hills are from 312 to 453 feet above the sea, the highest being towards the southern end. The low parts of the island are covered with grass and brushwood.

The island has about 700 inhabitants, produces good firewood, and has a considerable fishery.

Lat. 44° 38' N.  
Long. 14° 14' E.

**Port Unie**, on the western side of Unie island, is about half a mile wide at the entrance, recedes about the same distance, is open to north-westerly winds, and affords temporary anchorage for moderate-sized vessels.

The best berth is in a depth of 9 fathoms, sand, north-eastward of the islet off Nard point, the southern point of the bay; here there is shelter from all easterly winds. The southern side of the bay is bordered by shoal water, which includes the islet and continues along the shore to Arbit point, the south extreme of the island,  $2\frac{1}{4}$  cables off which there is a shoal marked by an iron beacon 15 feet high, surmounted by a white ball, in 7 feet water. At half a cable all around this shoal there is a depth of 5 fathoms.

**LIGHT.**—On Nétak point, the south-western extreme of Unie island and about a mile southward of port Unie, is a white tower adjoining a dwelling, 44 feet in height, from which is exhibited at an elevation of 56 feet above the sea, a *fixed* light, showing *white* when bearing from N. 39° W. (clear of the Canidole islands), through north and east, to

S. 14° E.; *red* from S. 14° E. to S. 4° W.; obscured elsewhere. The *white* light is visible in clear weather from a distance of 13 miles, *red* light at 7 miles. Chart, 2,711 [798].  
Var. 8° 35' W.

**Telegraph.**—There is a telegraph and signal station at Netak point.

**Anchorage.**—There is good anchorage sheltered from northerly and easterly winds in Vrulje bay on the south-western side of Unie island, in a depth of about 15 fathoms, with Netak point lighthouse bearing about N.N.W. distant 8 cables, and about the same distance from the eastern shore. Lat. 44° 37' N.  
Long. 14° 15' E.

On the eastern side of Unie are three small bays, named ports Lungo, Mezzo, and Fogon; they are exposed to south-easterly winds, which send in a considerable sea, but afford shelter against westerly and north-westerly winds.

**CANIDOLE ISLANDS** consist of two islands connected by a 3-fathoms ridge, and together are 2½ miles in length north-west and south-east and about 3 cables in width. The northern island, Great Canidole, is twice the length of the other and 197 feet high; Little Canidole is 157 feet high and has the small Silo islet or rock about 2 cables off its south-eastern end. The islands are partly wooded and the water is deep round them.

**Channel.**—They are separated from the southern end of Unie by a channel about 8 cables wide, with a depth of 12 fathoms in the middle. A vessel taking this channel should avoid the rock awash marked by beacon,\* nearly 2 cables from Arbit point, the south extreme of Unie, with a 5-fathoms patch outside it, by keeping nearer Great Canidole island than the point. \*Lat. 44° 36' N.  
Long. 14° 17' E.

**Anchorage.**—Shelter may be obtained from a Bora a short distance south-westward from the Canidoles, in 20 to 22 fathoms, sandy bottom.

**Light proposed.**—It is proposed to build a lighthouse on Silo rock, off the south-east end of Little Canidole.

**Unie channel.**—The large and partially land-locked space between Unie and Lussin islands affords a safe refuge to the numerous fishermen of this part of the Adriatic, who affirm that a large fleet might here ride out a gale of wind in complete security. The depths are very regular; from 24 to 26 fathoms, sand and mud.

**GALIOLA ISLE**, situated 5 miles north-westward from the northern extreme of Unie island, is a low rocky islet, surrounded by shoal water. On it is a white octagonal lighthouse 69 feet high, rising from the keeper's dwelling, which has a flat top. Lat. 44° 44' N.  
Long. 14° 0' E.

**LIGHT.**—From the lighthouse on Galiola isle is exhibited, at an elevation of 68 feet above the sea, a *group-flashing* light showing three *white* and two *red* flashes *every ninety-five seconds*, thus:—*White* flash, *six seconds*; *eclipse*, *thirteen seconds*; *white* flash, *six seconds*; *eclipse*, *thirteen seconds*; *white* flash, *six seconds*; *eclipse*, *thirteen seconds*; *red* flash, *six seconds*; *eclipse*, *thirteen seconds*; *red* flash, *six seconds*; *eclipse*, *thirteen seconds*. The light is visible in clear weather from a distance of 13 miles. See view on chart, No. 2,711.

**Fog signal.**—During thick or foggy weather a bell is sounded from the summit of the lighthouse for *five seconds* at intervals not exceeding *one minute*.

Chart, 2,711 [798].  
Var. 8° 35' W.

**SANSEGO ISLAND**, is the south-westernmost of the Quarnero islands; it is usually made by vessels on their way to sight cape Promontore before proceeding northward. Mount Garbe, its highest point, is 321 feet above the sea, and is crowned by a lighthouse; the island appears flat at a distance, is about  $1\frac{3}{4}$  miles long north-west and south-east, by one mile wide, and has a sandy soil.

The coast is steep and bold except at the points, near which the water is shallow; the island is somewhat in the form of a triangle with its shortest side to the south-east.

**Rocky patches**, with depths of 6 to 9 fathoms, lie from half a mile to nearly 2 miles from Vardicola point, the north-western end of the island, and, although the least known depth is 6 fathoms, it is advisable to keep clear of them to avoid the heavy sea which occasionally breaks. A rocky patch, with 11 fathoms, lies about 8 cables westward of Margarina point, the southern extreme of the island.

**Village**.—On its eastern slope, near the middle, is the village with a church. It has about 1,450 inhabitants; wine and fruit are the chief products.

Lat. 44° 31' N.  
Long. 14° 18' E.

**LIGHT**.—From a square two-storey building with tower above, 40 feet high, the whole painted red, at an elevation of 357 feet above the sea, is exhibited a *white revolving* light, with a period of *six seconds*, visible in clear weather from a distance of 20 miles, but obscured when bearing from S. 9° E. to S. 19° E. The lighthouse stands on mount Garbe, the highest point of the island, and from its height, when navigating the Quarnerolo channel, is visible from 15 to 20 miles distant, over Lussin island, when bearing from S. 71° W. to S. 73° W.; from S. 78° W. to S. 81° W.; from S. 82° W. to S. 83° W.; and from S. 86° W. to West.

**Anchorage**.—Vessels anchor 5 or 6 cables from the south-western shore of the island in a depth of 19 fathoms, sandy bottom, with Sansego village bearing about E. by N. This anchorage is useful in a Bora.

**Sansego harbour or Dragazul cove**, suitable for small vessels only, is on the north-eastern side of Sansego island and is quite open in that direction. In entering the cove the ruins of an old breakwater must be avoided.

**Harbour light**.—From the pier end in Sansego harbour, a *fixed* light, visible 4 miles, is exhibited at an elevation of 19 feet above the sea, showing *red* when bearing from N. 41° W., through west, to S. 67° W., but obscured by land when outside the harbour if bearing north of N. 72° W. Inside the harbour it shows *white* from N. 32° E. to S. 88° E. It may not be lighted in S.E. gales.

**Telegraph**.—Sansego island is connected with Lussin Piccolo by submarine telegraph, thence with the main land.

**GREAT QUARNERO CHANNEL**.—This channel, formed by the eastern coast of Istria on the one hand, and by Cherso, Lussin, Unie, and Sansego islands on the other, has a general depth of 27 to 30 fathoms, and is of safe navigation with reference to rocks and shoals. The narrowest part,\* between Nera and Zaglava lighthouses is  $6\frac{1}{2}$  miles wide, and at night, these lights, together with those of the Porer rock, Galiola islet, Unie island, Netak point, and Sansego, afford the seaman every facility for ascertaining his position. Northward of Nera and Zaglava lighthouses the channel at first widens and then again contracts to the narrow pass known as the Farasina channel and described at page 131.

The Bora is often very violent and dangerous in the Great Quarnero channel, and vessels are obliged to bear up for shelter under cape

\*Lat. 44° 56' N.  
Long. 14° 13' E.

Promontore or for one of the ports in the neighbourhood ; or if necessary, to anchor at once wherever they may happen to be. This wind undergoes remarkable shifts ; to the northward, it usually follows the direction of the channel ; towards the middle, it veers to the eastward, and it generally becomes northerly again as the shore of Cherso is approached. Chart, 2,711 [798].  
Var. 8° 35' W.

**The current** is rapid in the narrowest part, in northerly winds, when it sometimes attains a speed of 4 miles an hour. During the flood, it sets northward along the coast of Cherso and southward along the shore of Istria ; during the ebb, the direction throughout the channel is southerly.\*

**ASINELLO ISLAND**, south-eastward of Lussin, is about  $2\frac{1}{4}$  miles in length, a mile in breadth, 298 feet high, and has an irregular shore ; on its north-eastern side is the village of St. Pietro. The island of St. Pietro di Nembo lying parallel with the north-eastern shore of Asinello, together with the little isle Kosjak, 128 feet high, approach Lussin island so closely as to leave a narrow 8-fathoms channel only a cable wide between them. Radovan point, the south-eastern extreme of Asinello, is easily recognised, being long, low, and whitish. A mile westward of the point, a shoal with from one to 3 fathoms water projects from the shore.

**PORT St. PIETRO DI NEMBO** is in fact the channel between the island of that name and Asinello. The port thus formed is narrow, being from one to 2 cables wide, but more than a mile in length, with from 2 to 5 fathoms water. It may be entered by small craft at either end, but the south-eastern passage is the wider and better when the wind is favourable. Plan on 1,561  
[800].  
Lat. 44° 28' N.  
Long. 14° 33' E

The best anchorage, fit only for small vessels, is in  $3\frac{1}{2}$  fathoms abreast a ruined fort on the shore of St. Pietro di Nembo. In taking the north-western entrance, indicated by a church near some white cliffs on the eastern side, mid-channel should be preserved, when a depth of  $2\frac{1}{2}$  to 2 fathoms may be maintained, but the water on both shores and in the channel is very shallow until past the village of St. Pietro.

Water may be obtained at the village and also near the ruined fort.

The island of St. Pietro di Nembo is bold, 206 feet high, more than a mile in length, woody, with a church near its north-western end, which is a long half mile from Lussin. Kosjak is divided from St. Pietro di Nembo by a narrow  $4\frac{1}{2}$ -fathoms channel, but the current is too rapid to permit of either this or the passage between Kosjak and Lussin being taken without much caution.

**Harbour light.**—At about one cable south-eastward of the Health office on St. Pietro di Nembo island, a *fixed red* light, elevated 19 feet above the sea is exhibited, visible in clear weather from a distance of 5 miles.

**GRUICA ISLET.**—This small islet lies S.W. by S. distant  $1\frac{3}{4}$  miles from Radovan point, Asinello, and has on it a one-storey dwelling with lighthouse tower adjoining ; it is bordered by a bank extending more than a cable northward. Chart, 2,711 [798].  
Lat. 44° 25' N.  
Long. 14° 34' E.

**Bank.**—At 7 cables northward of the islet, between it and Asinello, is the centre of Gruica bank with  $3\frac{1}{2}$  fathoms water ; the bank is nearly a mile in extent within the 10-fathoms line, and elsewhere has from 7 to 9 fathoms. Between it and Asinello island is another patch with  $5\frac{1}{2}$  fathoms.

\* On February 27th, 1887, H.M.S. *Condor*, in crossing the Great Quarnero channel to get into the favourable current under Cherso made absolutely no headway, but drifted to leeward out of the channel ; the vessel at the time was steering E. by N. and the speed by the engines should have exceeded 7 knots ; the wind was E.N.E. and its force from 8 to 9.

General chart, 1,440 [789].

Chart, 2,711 [798].  
Var. 8° 35' W.

**LIGHT.**—From the lighthouse on Gruica islet, 42 feet in height, is exhibited at an elevation of 56 feet above the sea, a *fixed white* light varied by a *red flash* of *four seconds* duration every *minute*; it is visible in clear weather from a distance of 13 miles.

**Selve channel.**—The northern entrance of this channel between Gruica islet and Lutostrak islet off the northern end of Premuda island, is  $2\frac{1}{2}$  miles wide and clear of danger, except the Levante bank with 5 fathoms water, which is very small and lies nearly  $1\frac{1}{2}$  miles S.E. by E. from Gruica islet; it may be avoided by keeping either side of the channel aboard. *See also* page 155.

Lat. 44° 26' N.  
Long. 14° 38' E.

**Selve bank.—Beacon.**—The Selve bank is nearly half a mile in extent, with one fathom on the shoalest part, which part is marked by an iron staff surmounted by a skeleton ball and vane 13 feet above the sea. On other parts of the bank the depth is from 6 to 9 fathoms. The shoalest part lies E.N.E. distant  $3\frac{1}{4}$  miles from Gruica lighthouse, and N. by W. from the western extreme of Selve island, described at page 159.

Both the Levante and Selve banks are in the fairway of the approach to the Quarnerolo channel from the Selve channel; Gruica lighthouse W. by S.  $\frac{1}{4}$  S., leads half a mile southward of Selve bank. *See also* page 155, where the channel is again referred to.

Lat. 44° 29' N.  
Long. 14° 33' E.

**Anchorage.**—The **Great and Little Oriole**, situated half a mile eastward of the south-eastern extreme of Lussin, are two rocky islets nearly united and together not quite 2 miles in length; the Great Oriole is the northernmost of the two and is 91 feet high.

There is good anchorage between them and Lussin in a depth of 22 fathoms, mud and sand, sheltered from the Bora. Both the north-western and south-eastern entrances are clear of danger. A rocky shoal, awash, lies nearly 3 cables eastward of the northern part of Little Oriole.

Lat. 44° 37' N.  
Long. 14° 26' E.

**LUSSIN CHANNEL.**—The eastern coast of Lussin island is irregular, mostly high, and, with the southern end of Cherso, forms the Lussin channel. The two shores at the south-eastern end of the channel are a little over 3 miles apart and gradually converge until, after a distance of 7 miles, as before described, abreast the town of Ossero, they approach each other so closely as to leave a channel only 25 feet wide; *see* Ossero channel, page 137.

The water from the depth of 38 fathoms at the entrance, shoals gradually to the upper part of the channel, the bottom throughout being mud. The channel is too much exposed to south-easterly winds and sea for safe anchorage, but small vessels anchor at Martincica, Caldonte, port Sonte, and other small places. The passage through the Cavanella, from the Lussin to the Ossero channel is described at the page just referred to.

Lat. 44° 40' N.  
Long. 14° 24' E.

**Light.**—At Neresine on the western side of Lussin channel, and about one mile south of the entrance to Cavanella, a *fixed white* light is exhibited from the mole head, elevated 16 feet above the sea, and visible 3 miles.

Lat. 44° 31' N.  
Long. 14° 30' E.

**Port Rovenska.**—Lussin Grande village stands on a hillock, and points out the position of port Rovenska, on the eastern coast about  $2\frac{1}{2}$  miles from the southern end of Lussin island; this small port is open to the North and has sufficient space for small vessels only. Northerly and easterly winds occasion a heavy sea at the entrance.

**Light.**—From an iron support 34 feet high, 18 yards within Cappellata point at Lussin Grande, a *fixed* light is exhibited, which shows *red* when bearing from N. 41° W., through west, to S. 78° W., and from N. 18° E. to N. 78° E.; *white* elsewhere. It is visible in clear weather from a distance of 6 miles.

Chart, 2,711 [798].  
Var. 8° 30' W.

**Croce point.**—The southern end of Cherso island is about 2½ miles across, and slopes gradually southward with a rugged and irregular coast line forming several small but deep inlets, the points being bordered by shallow water. Croce point, the central projection, is low and is on the eastern side of port St. Andrea, the principal inlet, which alone has sufficient space for small vessels.

**ORUDA ISLAND.**—About 4 miles south-south-eastward of Croce point is the northern end of Oruda island, two-thirds of a mile in length and 46 feet high; beyond it is Palazzuol islet. These are connected and surrounded by shallow water.

Lat. 44° 33' N.  
Long. 14° 35' E.

**Beacon.**—At one mile E. by S. of Palazzuol, is a sunken rock marked by an iron beacon surmounted by a skeleton ball.

**Palazzuoli bank.**—Numerous shallow rocky patches extend 3 miles N.N.W. of Oruda island, with deep water between them, and in the middle is the Kraljetto, a sunken rock.

**Beacon and buoy.**—An iron pole with an open ball topmark, elevated 19 feet above the sea, marks a rock with 4 feet water on the south-west side of Palazzuoli bank; from it the north extreme of Oruda bears S.E. by E. ¾ E., distant 11 cables.

A beacon buoy lies on the northern edge of the shoal patches described, the navigable channel lying between the buoy and Croce point. The buoy is surmounted by an iron cage painted white, and lies in 22 feet water, with fort Asino bearing W. ¾ S., and Terstenik lighthouse N.N.E. ¼ E.

**Terstenik island,** three-quarters of a mile in length with a lighthouse 58 feet in height, on its highest part, is about 2½ miles north-eastward of Kolorat point, Cherso island.

Lat. 44° 40' N.  
Long. 14° 45' E.

**LIGHT.**—From the lighthouse on Terstenik island is exhibited an elevation of 77 feet above the sea, a *fixed* light visible in clear weather from a distance of 14 miles, showing *white* except when bearing from N. 29° E. to N. 36° E., when it shows *red*, and is strongest in the axis of this sector.

The *red* sector shows in the direction of the navigable passage between the southern end of Cherso and the dangers extending northward from Oruda island with not less than 5 fathoms water.

**Eastern Coast of Cherso.**—At 5 miles north-westward from Terstenik lighthouse, and a mile from the shore of Cherso, is the little islet of Cutin.\* Between the islet and the shore is a shoal with a depth of 3½ fathoms; and, three-quarters of a mile southward of the islet, and a mile from the shore, is a shoal half a mile in length, with only 2 fathoms water. From thence northward along the eastern coast of Cherso, through Corsia and Veglia channels, though there are no outlying dangers, there are no anchorages, and the whole of this coast being exposed to the Bora, a near approach to it is to be avoided. With proper care, the chart is sufficient guide.

\*Lat. 44° 43' N.  
Long. 14° 24' E.

**Caisole cove.**—There is a small boat harbour at Caisole, on the eastern coast of Cherso, formed by a mole within which there is a depth of nearly 10 feet.

Lat. 45° 7' N.  
Long. 14° 21' E.

Chart, 2,711 [798].  
Var. 8° 30' W.

**VEGLIA ISLAND.**—General remarks.—Veglia is the most northern and the largest of the Quarnero islands, somewhat triangular in form, 20 miles in length, with an extreme breadth of 11 miles, and of all the islands in the Austrian dominions is only second to Lissa in the number of its inhabitants, which is estimated at about 18,000, and it is superior to Lissa in the variety and abundance of its produce.

\*Lat. 44° 59' N.  
Long. 14° 42' E.

Of the various mountains, Orliach,\* 1,763 feet above the sea, and Triskovac, 1,775 feet, both in the south-eastern end of the island, with mount St. Giorgio, 1,076 feet high, near the north-eastern coast, are the most remarkable; the greatest heights being towards the south-eastern end.

The south-western part is lower and more fertile than the opposite side, but a great portion is covered with woods. The island is noted for a peculiar breed of small and active horses. The gentle slopes of the higher parts afford pasturage which is highly esteemed; the wine is the best produced in the Quarnero, and the olives and various fruits grow luxuriantly.

The northern coast is high, rugged, and of whitish appearance, except north-westward between Pelova point and Sottile point, Castelmuschio bay, where patches of cultivation alternate with woodlands. The country in the neighbourhood of the town of Veglia, on the south-western side of the island, is well cultivated and of agreeable aspect, as is the southern coast generally; near the south-eastern extreme it is rocky and barren.

**Veglia bay**, situated near the middle of the south-western coast, is 2½ miles wide between the entrance points and nearly 1½ miles deep; it affords anchorage for vessels of any size in depths of from 5 to 11 fathoms, muddy bottom. Bora squalls reach it from the elevated valleys of mount Triskovac, and it is advisable to anchor under the south-eastern shore of the bay, off Caneve cove, and to take every precaution against this wind.

Plan of port  
Veglia on  
1,561 [300].  
Lat. 45° 2' N.  
Long. 14° 35' E.

**The port of Veglia**, in the north-western part of the bay, is merely a creek protected by a small mole, under cover of which large boats or craft of very light draught lie well protected from southerly winds; the depth in the middle is little more than 6 feet.

**The town** of Veglia stands high, contains about 1,700 inhabitants, has a cathedral and several other important buildings, and is defended by walls and a castle. Spring water may be obtained, and it is the chief place of export for the produce of the island.

**Mooring buoy.**—Outside the breakwater, in a depth of about 7 fathoms, is placed a mooring buoy, but it is only serviceable for small vessels in fine weather.

**Telegraph cables.**—The port of Veglia is a telegraph station, the island being connected by cable from Rebizza point with the mainland at Spasovac near Zengg, and with Cherso by cable from Grego morte cove on the western side of Veglia, to the northern end of the Corsia channel, both shore ends of this cable being marked by turrets. The island is also connected by cable with Arbe island.

**LIGHTS.**—On the molehead at port Veglia is a small stone tower, from which is exhibited at an elevation of 23 feet above the sea, a *fixed white* light, visible in clear weather from a distance of 6 miles.

Chart, 2,711 [798].

**Negritto point.**—At Negritto point, the south-eastern point of Veglia bay, is a *fixed red* light elevated 42 feet above the sea, visible in clear weather from a distance of 9 miles. The light is exhibited from an

iron framework attached to the keeper's white dwelling, which is close to the shore. Chart, 2,711 [798].  
Var. 8° 30' W.

**Cassion bay** is a basin a mile long and 8 cables wide in the north-eastern part of Veglia bay; it is almost land-locked and is only frequented by small craft to load with firewood; the entrance has a depth of 9 feet, over a breadth of 54 yards. Stone conical beacons, 90 yards apart in a north-west and south-east direction, are erected some 15 yards within the edges of the channel; the best water is midway between them. Lat. 45° 2' N.  
Long. 14° 37' E.

**Lights.**—Two *fixed green* lights placed vertically, 27 and 17 feet above the sea, and visible in clear weather from a distance of 3 miles, are exhibited from an iron crane on a stone pillar situated on the eastern side of the entrance to Cassion bay.

**The coast** between Veglia bay and Suh point forms the eastern shore of the Veglia channel,  $2\frac{1}{2}$  miles wide at its narrowest part, and is everywhere steep-to.

**PLAUNICK ISLAND**, in south approach to Veglia channel, is about 3 miles in length,  $1\frac{1}{4}$  miles in breadth, and 636 feet high. Its shores are generally bold with the exception of the south-eastern end, where shallow water extends off more than half a mile, and beyond this again is Cormato islet, 26 feet high, 7 cables in length, and very narrow.

**Corsia channel.**—Between Plaunick island and the coast of Cherso on the west, is the Corsia channel, clear of danger, deep, half a mile wide, and forming the connection between the Quarnerolo and Veglia channels in steering by this route for the gulf of Fiume.

**LIGHT.**—On Crussia point, the north-west extreme of Plaunick island, stands a white iron circular lighthouse on a masonry base 41 feet high, from which, at an elevation of 72 feet above the sea, is exhibited a *fixed white* light (unwatched), visible in clear weather from a distance of 8 miles. Lat. 44° 59' N.  
Long. 14° 29' E.

**Dangers.**—The north-eastern point of Plaunick island is  $1\frac{3}{4}$  miles from the nearest part of the coast of Veglia, and between them there are no dangers and the soundings are deep; but, between the island and Veglia bay, and towards Negritto point, are three shoals, viz.:—Pitic bank with 2 fathoms water, about three-quarters of a mile N. by E.  $\frac{3}{4}$  E. from the south-eastern end of Cormato islet; Bondenegrutto shoal with  $3\frac{1}{2}$  fathoms, midway between Cormato islet and Negritto point; and, half way between Plaunick island and the shore of Veglia bay, in the middle of the entrance to that bay, is But shoal with 4 fathoms. These dangers have deep water close round them and may be avoided by keeping the coast of Veglia aboard.

**LIGHT.**—On Morganillo point, the west extreme of Veglia island, a *fixed white* light (unwatched) is exhibited from a conical white iron turret, at an elevation of 36 feet above the sea, visible in clear weather from a distance of 7 miles. Lat. 45° 4' N.  
Long. 14° 26' E.

**Cavlena bay.**—Vessels may anchor in Cavlena bay on the north-western coast of Veglia, northward of Suh point, or Sta. Maria point, as it is sometimes called from the monastery of Sta. Maria di Capo, which is built on the point. Large vessels should anchor about 4 cables from the shore, in a depth of 25 fathoms, good holding ground. This anchorage is well protected by Cherso island from south-westerly winds and is exposed only to those from northward or westward.

Chart. 2,711 [798]  
Var. 8° 30' W.

**Malinska road** is close eastward of Pelova point, which point separates this road from Cavlena anchorage. Vessels of deep draught anchor in a depth of 19 fathoms, mud, between two small creeks protected by moles, one on each side of the bay, and about 3 or 4 cables from the shore. Smaller vessels, drawing too much water to haul inside the moles, anchor nearer the beach. There is a mooring buoy westward of Malinska lighthouse. North-westerly winds are troublesome, but although they sometimes occasion a considerable sea they are not dangerous at this anchorage. Water may be obtained at Malinska village.

Lat. 45° 7' N.  
Long. 14° 32' E

**LIGHT.**—A *fixed red* light is exhibited from a lamp-post on the molehead at Malinska; it is elevated 19 feet above the sea and visible in clear weather from a distance of 5 miles.

**Sasso Bianco road**, 2 miles northward of Malinska, is also exposed to north-westerly and south-westerly winds. The anchorage is in a depth of about 10 fathoms, muddy bottom, abreast the small village Njivice.

The high, rounded, and wooded Pelova point, is a good mark for both Sasso Bianco and Malinska road.

Lat. 45° 13' N.  
Long. 14° 33' E.

**CASTELMUSCHIO BAY**, near the northern extreme of Veglia, is protected by the low narrow peninsula terminating in Sottile point, which, projecting  $1\frac{1}{2}$  miles northward, forms its western side. It is half a mile wide, and has a depth of 29 fathoms in the middle of its entrance, which decreases to 14 fathoms opposite the village at the head of the bay; on the eastern side, the space is sufficient for a number of vessels of the largest size, but the Bora is sometimes severely felt at this anchorage.

A shoal extends northward from Sottile point, on the western side, which should not be passed within 2 cables. Both points of the bay eastward of Castelmuschio are bordered by reefs and should not be approached too closely.

About half a mile within Kiac point on the eastern side of the entrance to Castelmuschio bay is port Lucizza, which is preferred by small vessels to a position higher up the bay; the anchorage in this port is in about 7 fathoms, securing to the shore against the Bora.

Water and small supplies of provisions may be procured in Castelmuschio bay.

Lat. 45° 15' N.  
Long. 14° 34' E.

**ST. MARCO ISLET** is a barren rocky islet 342 feet high, close to the northern extreme of Veglia island; it divides into two channels the entrance to the Maltempo channel, between Veglia and the Croatian coast. The south-western one, between St. Marco and Veglia, is too narrow except for small vessels under favourable circumstances; that between the islet and the coast is about a quarter of a mile wide, with depths of from 32 to 9 fathoms, and has no hidden dangers.

**LIGHT.**—From an iron conical turret, painted red, with stone base, situated 24 yards within the north-eastern point of St. Marco islet, a *fixed white* light (unwatched) is exhibited at an elevation of 49 feet above the sea, visible in clear weather from a distance of 8 miles, between the bearings of N. 17° E., through east, and S. 49° E.

**Anchorage.**—There is a depth of 7 fathoms, mud, in a little bay between St. Marco islet and a small rocky peninsula near the northern extreme of Veglia. Vessels anchor in the centre of the bay and lay out a cable to the peninsula, where is the village and church of Voos. This anchorage is useful to vessels overtaken by a Bora after entering the Maltempo channel from the westward.

\*Lat. 45° 15' N.  
Long. 14° 34' E

**MALTEMPO\* and MORLACCA CHANNELS.**—Maltempo channel is formed by the coast of the mainland southward of Porto Re on the one side, and the island of Veglia on the other, and is the

northern portion or continuation of the Morlacca channel, described at page 165. It derives its name from the fury with which it is assailed by Bora gales. It has deep water, is very narrow and winding between St. Marco islet and the mainland and for 4 or 5 miles to the south-eastward, the currents are always rapid, and the only shelter is in some coves on the Croatian shore. The following three lights assist the navigation of these narrows:—

**LIGHTS.**—At Dubno point, on the mainland eastward of St. Marco islet, a *fixed red* light, visible 2 miles, is exhibited from an iron crane over a shed, at an elevation of 79 feet above the sea.

At Voschizza point, Veglia island, a *fixed white* light, visible in clear weather from a distance of 8 miles, is exhibited from an octagonal stone turret attached to a dwelling-house, at an elevation of 39 feet above the sea.

At Ertac point, on the mainland, a *fixed green* light, visible 2 miles, and elevated 29 feet above the sea, is shown from an iron crane attached to a dwelling.

**Coast.**—Between Porto Re and port Segna or Zengg, 23 miles south-eastward of the former, the coast of Croatia is barren and precipitous; the town of Novi, about 10 miles northward of Segna, being the only remarkable object.

**Dobrigno bay** on the north-eastern coast of Veglia, and about 6 miles from its northern extreme, affords excellent shelter for vessels drawing less than 12 feet, which is the general depth in the bay. A shoal covered with 6 feet water, which should be carefully avoided, lies about a quarter of a mile outside the northern point of entrance.

A bank, about 220 yards in diameter, with a depth of one fathom at its middle part, is situated N. 70° W. distant  $6\frac{3}{4}$  cables from the lighthouse at the entrance of the bay.

**LIGHT.**—On the southern side of entrance to Dobrigno bay, a *fixed white* light, elevated 29 feet above the sea, is shown from a masonry tower with gallery, visible in clear weather from a distance of 5 miles, when bearing from S. 84° W., through south, to N. 89° E.

**Stipana bay.**—The north-eastern coast of Veglia is swept by the Bora, and, although there are several small indentations called ports, Stipana bay is the only refuge from this wind for any other than vessels of very light draught. It is about  $1\frac{1}{2}$  miles south-eastward of Dobrigno bay, and is protected by the long narrow tongue of land forming Sillo point. It is advisable to anchor in a depth of from 15 to 17 fathoms, mud, near the eastern side of the bay, with a cable to the shore north-eastward. Sillo point is foul, and, half a mile southward of it, a shoal with  $2\frac{1}{4}$  fathoms water extends a quarter of a mile off-shore.

**LIGHTS.**—The following lights are shown at this part of the Maltempo and Morlacca channels, all but that of Verbenico being on the shore of the mainland:—

Crkvenica.—On the head of the southern mole at Crkvenica, a *fixed red* light is exhibited, elevated 20 feet above the sea, and visible 4 miles.

The entrance to port Crkvenica is marked by several buoys. Dredging is being carried out in the harbour, which is to have a depth of 13 feet throughout.

Selce.—A *fixed white* light, visible in clear weather from a distance of 12 miles, is exhibited on the point southward of Selce cove, at an elevation of 41 feet above the sea, from an iron post on the keeper's dwelling.

A *fixed green* light, elevated 14 feet above the sea, visible 2 miles, is shown from the pier-head at Selce.

Chart, 2,711 [798].  
 Lat. 45° 8' N.  
 Long. 14° 47' E.  
 Var. 8° 30' W.

**Novi.**—At the little port of Novi, a *fixed red* light, elevated 19 feet above the sea, visible 2 miles, is shown from an iron crane over a shed on the South molehead.

A *fixed white* light, elevated 11 feet above the sea, visible 2 miles, is shown from an iron lamp post on the Inner molehead.

**Verbenico.**—From the molehead of this port, on the eastern coast of Veglia, a *fixed white* light is exhibited, elevated 17 feet above the sea, visible in clear weather from a distance of 5 miles. Temporarily discontinued.

A (provisional) *fixed white* light is shown from an iron standard on the mole, visible from S. 4° W. to West (unreliable).

**Telegraph.**—There is a telegraph station at Verbenico.

**Sezza island.**—This little island, steep to all round, lies in the fairway of the Morlacca channel, one mile from the coast of Veglia, and W. by N.  $\frac{1}{2}$  N. 2 $\frac{1}{4}$  miles from the South molehead at Segna.

Lat. 44° 58' N.  
 Long. 14° 46' E.

**BESCANUOVA BAY**, at the south-eastern extreme of Veglia, is completely exposed to south-easterly winds and is seldom visited except by small coasting vessels and boats for water and vegetables, of which there is an abundant supply.

A **mole**, about 280 yards in length, north-east and south-west, projects from the shore about half way between the town of Bescanuova and Kricin point. The land in the vicinity of the village is highly cultivated. A shoal awash extends a cable off-shore from point Skuliza, the southern point of the bay.

**Light.**—From an iron support over a small red structure on Bescanuova molehead, at an elevation of 33 feet above the sea, a *fixed green* light is exhibited, visible in clear weather from a distance of 5 miles, between the bearings of N. 74° W., through north, to S. 82° E.

**Telegraph.**—There is a telegraph station, at Bescanuova town.

**PERVICCHIO ISLAND**, situated with its north extreme about half a mile from the south-eastern end of Veglia, is 4 $\frac{1}{4}$  miles in length north-west and south-east, 1 $\frac{1}{2}$  miles in breadth, 1,191 feet high, hilly, and barren; the Niviza rock and a rocky shoal extend about a quarter of a mile off-shore from the middle of the western side.

The channel between Pervicchio and Veglia, named the Bocca di Segna, is used by vessels bound to port Segna on the coast of Croatia. Mid-channel should be preserved, as shoals extend from the two points of the islands which are nearest each other.

The Bora often blows through this passage with considerable violence, and it is advisable to reduce sail before entering, and to seek shelter under the lee of Veglia island at the least indication of this wind approaching.

**LIGHT.**—On Maistro point, the north-western extreme of Pervicchio island, is a dwelling of reddish stone one storey high, from a stone turret above which is exhibited, at an elevation of 75 feet above the sea, a *fixed white* light, visible in clear weather from a distance of 11 miles.

Plan of Segna on  
 1,561 [800].  
 Lat. 44° 59' N.  
 Long. 14° 54' E.

**PORT SEGNA, or ZENGG**, situated on the mainland opposite the south-eastern part of Veglia, where the Morlacca channel is 3 $\frac{1}{2}$  miles wide, is formed by two moles, the Maria Art mole projecting in a northerly direction (with defensive works to extend westward about 55 yards from it, under construction) from the south-western point of the bay; and the San Ambros mole from the northern point in a south-westerly direction. The mole-heads are 1 $\frac{1}{2}$  cables apart north-east and south-west from each other. Midway between, from the centre of the town, projects a third or harbour mole; off it, and nearly in line between the outer moleheads is a mooring buoy. There is also a small wooden pier on masonry supports, with a depth of 11 feet at its outer end, in front of the Bishop's palace.

The harbour is protected from southerly winds by the southern point, but is exposed to north-westerly winds. Every precaution should be taken against the Bora, which is severely felt here; the holding ground is not good and anchorage under Arbe island is preferable to exposure to Bora gales at Zengg. It often happens that while a heavy Bora is blowing at Zengg, a calm or a light breeze prevails 5 or 6 miles seaward.

Plan of Segna on  
1,561 [800].  
Lat. 44° 59' N.  
Long. 14° 54' E.  
Var. 8° 30' W.

**The town** of Zengg or Segna, which is close to the shore, is partly built on the hilly point which juts out westward, and is commanded by a large fort 280 feet above the sea. It is one of the least frequented commercial places of Croatia and has about 3,200 inhabitants. Building timber from Croatian forests and tobacco are exported.

**Supplies.**—Water, provisions, and materials for slight repairs are procurable.

**Telegraph cable.**—There is a telegraph station at Zengg in connection with the cable which is laid from Spasovac cove, about 1½ miles southward of Zengg, to Rebizza point in Veglia island.

**Tides.**—It is high water, full and change, at Zengg at 8h. 25m.; rise 1½ feet.

**LIGHTS.**—At San Ambros molehead, from an iron support above the keeper's dwelling, and at an elevation of 27 feet above the sea, is exhibited a *fixed white* light, visible in clear weather from a distance of 10 miles, when bearing from S. 31° W., through south and east, to N. 59° W.

Maria Art mole.—From an iron crane over a shed, on Maria Art molehead, a *fixed red* light is exhibited, elevated 17 feet above the sea, and visible 4 miles, between the bearings S. 8° W., through south and east, to N. 14° W. It cannot be shown during heavy weather.

Central mole.—Two small *fixed green* horizontal lights, elevated 15 feet above the sea, visible about a mile, are exhibited from iron supports on stone bollards at the harbour molehead; they are visible between the bearings N. 31° E., through east, and S. 20° E., but cannot be shown during heavy weather.

**Directions.**—There are no dangers in the approach to port Segna. By night, vessels from the south-eastward should sight the *green* lights on the central mole, between the *red* and *white* lights on the outer moleheads before entering the port.

**MORLACCA CHANNEL**, the continuation of the Maltempo channel from the northward as described at page 148, embraces the coast and islands bordering it as far southward as the Montagna channel leading to the Mare di Novegrad. Chart, 2,711 [793].

The long chain of high mountains rising about a quarter of a mile from the sea, occasions violent Bora squalls, which render the navigation dangerous, especially as the channel affords scarcely any tolerable anchorage. The coasting vessels which use it on their way to Zengg, Carlopago, and Novegrad keep close to the shore, so as to be within reach of the various coves and creeks in it, and never remain under way at night during the bad season.

For the course or trend of the channel and the positions of the very few outlying dangers, reference should be made to the chart.

**St. Giorgio, Molini cove, and Lukovo.**—Between Zengg and Carlopago the coast is steep, rocky, and affords but little shelter. Small vessels anchor at St. Giorgio nearly 4 miles southward of Zengg, where there is a short mole; also in Molini cove, 1½ miles southward of

Chart, 2,711 [798].  
Var. 8° 30' W.

St. Giorgio, which is open to the northward and has a 6-foot shoal in the entrance, situated half a mile north of Molino point. This shoal is marked by a cone-shaped stone beacon 6 feet high; the passage between the beacon and point is free from danger.

\*Lat. 44° 51' N.  
Long. 14° 53' E.

Shelter will also be obtained abreast the town of Lukovo,\* about 8 miles southward of port Zenggo, where there is a small bay open to the northward; the anchorage is about a cable from the shore, to which it is customary to make fast. Water may be obtained from a fountain close to the shore about a mile northward of the anchorage.

**LIGHT.**—From an iron support on the molehead at St. Giorgio, at an elevation of 21 feet above the sea, a *fixed white* light is exhibited, visible in clear weather from a distance of 6 miles, between the bearings S. 78° E., through south, to S. 12° W.

Lat. 44° 52' N.  
Long. 14° 45' E.

**Gregorio islet**, 2 miles south-westward from Pervicchio island, is barren,  $2\frac{1}{4}$  miles in length, 760 feet high, and steep-sided. In case of emergency, a vessel may anchor, sheltered from easterly winds, in Gregorio bay on the north-western side, in a depth of about 16 fathoms, muddy bottom.

**Goli islet**, nearly a mile south-eastward of Gregorio, is  $1\frac{3}{4}$  miles in length and 760 feet high. Shoal water extends some distance from its north-western point, and Mali Goli islet, rocks, and shallow water, extend half a mile off from its southern point. A vessel may anchor southward of Goli and close to the mainland during a Bora.

**ARBE ISLAND.**—This island is nearly 12 miles in length and varies in width from  $1\frac{1}{2}$  miles at its southern part to about 6 miles at the northern; the coast line of this latter part is irregular and has deep indentations. A chain of hills, of which the highest, mount Tinjarossa,\* is 1,338 feet above the sea and near the centre, extends throughout the entire length of the island from north-west to south-east.

There are about 4,500 inhabitants, and it is one of the most important of the Quarnero group. The products are wheat, wine, olives, silk, and firewood, and a great number of sheep and cattle are reared; there are also marble quarries. Excellent wine is produced at Barbato, near the south-western end of the island.

**Telegraph cables.**—Arbe is connected with Veglia by a telegraph cable which leaves the shore of Arbe at point Stojan and is landed near Pago at the southern point of Veglia, at the western entrance to the Bocca di Segna. Ferkanjo point, port Arbe, is also connected with St. Martino, Pago island, by telegraph cable.

**PORT ARBE**, at about the middle of the south-western coast, is nearly  $2\frac{1}{2}$  cables in length and rather less than a cable in breadth, with 3 to 12 feet water, and is sheltered from all winds by a mole extending south-westward from the eastern shore. The entrance to the port is between the town and Tonera islet  $1\frac{1}{2}$  cables south-eastward of it.

**The town** of Arbe, with 750 inhabitants, is pleasantly situated on the little projection which forms the south-western side of the port. It is the centre of the commerce of the island and contains a cathedral and a collegiate church. In the neighbourhood are some salt works.

**Tonera islet** is a cable in extent, 31 feet high, and connected with the main by shallow water. A breakwater, 6 feet in width and 6 feet above the sea, projects eastward from the islet towards the end of a similar breakwater extending from the shore and leaving an opening 20 feet wide for boats.

Plan of port Arbe  
on 1,561 [800].  
Lat. 44° 45' N.  
Long. 14° 46' E.

**Euphemia cove.**—A tongue of land terminating in Ferkanjo point, westward of the town, projects south-eastward parallel with the shore and forms the narrow inlet named Eufemia cove more than a mile deep; here there is a well-sheltered anchorage 7 cables in extent north-west and south-east by  $2\frac{1}{4}$  cables in width, with depths of from 4 to 15 fathoms, muddy bottom.

Plan of port Arbe  
on 1,561 [800].  
Lat.  $44^{\circ} 45' N.$   
Long.  $14^{\circ} 45' E.$   
Var.  $8^{\circ} 30' W.$

**Lights.**—Tonera.—On the northern extreme of Tonera islet, from a green iron column 15 feet high, a *fixed red* light is exhibited at an elevation of 40 feet above the sea, visible in clear weather at a distance of 4 miles.

A small *fixed green* light, elevated 13 feet above the sea, is shown from the molehead at the entrance of the port, visible one mile.

On Ferkanjo point, a *fixed green* light, elevated 16 feet above the sea, is exhibited from an iron support, visible at the distance of 2 miles.

**Shoals.—Beacons.**—On Garofolin rock,  $1\frac{3}{4}$  cables south-eastward of Ferkanjo point, is a beacon consisting of an iron pole, surmounted with an openwork ball, elevated 21 feet above the sea; it is liable to be washed away.

**A shoal** with 2 fathoms lies between Garofolin rock and Dolin island.

An iron beacon, surmounted by two white discs, crossed, elevated 23 feet above the sea, is placed in 9 feet water near the edge of the shoal extending from San Antonio point.

**Dolin island** is a long narrow strip running parallel with the south-western coast of Arbe island for about 5 miles, the space between forming the Barbato channel. Dolin island is 173 feet high at the north-western end, 384 feet high at the south-eastern end, and in no part more than half a mile wide; it is thickly covered with bushes. The approach to port Arbe is between its north-western end and Ferkanjo point.

Chart, 2,711 [798].

**Barbato channel.**—This long channel between the shores of Dolin and Arbe islands has an average width of about 2 cables and the depth in the middle varies from 7 to 13 fathoms, sand; the bottom near Dolin is rocky. It affords excellent well-sheltered anchorage for a considerable number of vessels in three places, viz. :—about two-thirds of a mile within the north-western entrance, where, abreast the small bay of Sta. Lucia, is the widest part of the channel; a little south-eastward of the small church of St. Stefano, where the shore of Arbe is bordered by a sand bank; and, about 2 miles from the south-eastern end of Dolin island. It is customary to anchor midway between the two shores and to lay out a cable to the north-eastern shore.

Lat.  $44^{\circ} 44' N.$   
Long.  $14^{\circ} 48' E.$

There is a fountain with an abundant supply of water a short distance eastward of St. Stefano church.

**Directions.**—The approach to port Arbe is between Ferkanjo point and Dolin point,  $7\frac{1}{2}$  cables apart, the passage either to port Arbe or to the other anchorages named, lying between these two points. Ferkanjo point should not be approached too closely in a vessel of deep draught; the deepest water between the Garofolin rock beacon and Ferkanjo point is about 13 fathoms in mid-channel or rather nearer the shoal. Between this beacon and the north-western end of Dolin island is a 2-fathoms patch before mentioned; the water between these dangers and near Dolin point is deep.

Plan on  
1,561 [800].

Chart, 2,711 [798].  
 Var. 8° 30' W.  
 \*Lat. 44° 41' N.  
 Long. 14° 51' E.

In taking the south-eastern entrance to the Barbato channel, the Cantarara rocks,\* extending  $1\frac{1}{2}$  cables from the south-eastern end of Dolin island, must be avoided; and Poklib rock, united to Arbe by a rocky 4-fathoms ledge, must be left on the starboard hand.

**ARBE, east coast.—Glavina bank,** lying about 2 cables off Glavina point, the south-eastern extreme of Arbe, has a general depth of  $2\frac{1}{2}$  fathoms, with a rock having less than 6 feet water at its north-western edge; a beacon 16 feet high marks this rock, consisting of an iron pole with open-work ball on top. The southern extreme of the bank is half a mile from the point, but there is a channel about one cable in width between the beacon and the shore.

Lat. 44° 43' N.  
 Long. 14° 52' E.

**Port Omago** is a small inlet, open to the north, at the eastern extreme of Arbe island; it affords a convenient shelter to small vessels overtaken by a Bora in the Morlacca channel. Rocks above water extend about  $1\frac{1}{2}$  cables northward from the point of entrance, and about half a mile farther northward is the islet of Lukovaz, a quarter of a mile from the shore, with shallow water extending from its northern end.

In the port, the depth is from 7 to 9 fathoms, muddy bottom.

**Bilibrach shoal.**—This shoal, with a depth of  $5\frac{1}{2}$  fathoms, lies  $1\frac{1}{2}$  miles N. by W.  $\frac{1}{4}$  W. from Lukovaz islet, and is rather more than half a mile from the coast of Arbe island. The eastern extreme of Arbe island kept open eastward of Lukovaz leads eastward of it.

**Coast.**—From port Omago, the north-eastern side of Arbe island is nearly straight in a north-west direction and is an exposed ironbound coast until near its north-western end, when it first trends eastward, forming Cernica bay, and then round by north and west to its termination. From Cernica bay, the coast is broken and irregular, bordered here and there by shallow water and rocks, leaving between it and Gregorio islet a deep passage 3 or 4 cables wide, but seldom or never used.

**ARBE, north-west coast.**—In the north-western end of Arbe island are three deep inlets or bays, viz.:—Loparo bay, the most northern; port St. Pietro in the centre; and Kampora bay, the most western.

Lat. 44° 51' N.  
 Long. 14° 43' E.

**Loparo bay,** the northern inlet at the north-western end of Arbe island, is shoal at its eastern side and at its head; it is open to the north-west, and is not a convenient anchorage.

**Vela rock,** at the north-eastern point of entrance to Loparo bay, is marked by an iron beacon, surmounted by an open ball elevated 11 feet above the sea. Pregeba bank extends some distance northward of the beacon, which must therefore be given a wide berth.

Lat. 44° 49' N.  
 Long. 14° 42' E.

**Port St. Pietro,** the central inlet, is also open to the north-west, but otherwise is well sheltered from all winds, and has depths of from 12 to 14 fathoms abreast of the Health office on the north-eastern side, at a convenient distance from the shore for laying a cable to it. The shore of mount Sorinja should be closed on entering this anchorage, and the south-western side of the bay, which is bordered by shoal water, should be avoided. There are two good springs close to the beach.

**Sorinja bank.**—At 4 cables off Sorinja point, the north-western extreme of Arbe island, is Sorinja bank, a 4-fathoms rocky patch, with deep water between it and the point.

**Kampora bay,** the western inlet, is south-westward of port St. Pietro, to which it is inferior as an anchorage. The best anchorage is in a depth of 10 or 11 fathoms, mud, off the village, which is on an

eminence on the port hand in entering. The north-eastern side of the bay should not be closed in the outer part, as there is a rock awash and the shore is bordered by shoal water. Chart, 2,711 [798].  
Var. 8° 30' W.

**LIGHT.—Cape Fronte.**—On the south-west point of cape Fronte a *fixed red* light (unwatched) is exhibited from an iron tower, at an elevation of 34 feet above the sea, visible in clear weather from a distance of 6 miles, between the bearings S. 17° W., through south and east, to N. 34° W. Lat. 44° 47' N.  
Long. 14° 39' E.

**Anchorage.**—Between cape Fronte on the western side of the island and the port of Arbe, the coast is broken and has several coves where coasting vessels load with firewood sheltered from the Bora. These places are also resorted to for temporary refuge by ordinary merchant vessels. There are one or two patches near the shore, with 3 to 4 fathoms water, which may be avoided by reference to the chart.

**LAGANJ\* and DOLFIN ISLETS**, situated  $4\frac{1}{2}$  miles west of port Arbe, are two barren islets  $1\frac{1}{2}$  miles apart, each about half a mile in extent; they are almost connected by rocky shoals, and together extend over a space of about  $2\frac{1}{2}$  miles. \*Lat. 44° 43' N.  
Long. 14° 40' E.

Laganj, the northern islet, is 23 feet high; a rock or smaller islet lies off its southern end, and banks with from 6 to 10 fathoms water extend from it  $1\frac{1}{2}$  miles in a N.N.W. direction.

Dolfin islet is 75 feet high; it has a rock awash off its northern end and a large rock off its southern end, where the islet is surrounded by a bank with from  $5\frac{1}{2}$  to 10 fathoms water. Small vessels anchor for temporary refuge against a Bora about 2 cables from the south-western side of Dolfin islet.

**LIGHT.**—On the summit of Dolfin islet stands a conical iron lighthouse 33 feet in height, from which, at an elevation of 104 feet above the sea, is exhibited a *fixed white* light (unwatched), visible in clear weather from a distance of 7 miles. Being altered to *flashing white*, temporarily unreliable. Lat. 44° 41' N.  
Long. 14° 41' E.

**QUARNEROLO CHANNEL.**—**General remarks.**—This channel is bounded on the north by Veglia and Plaunick islands; or the west by Cherso, Lussin, Asinello, &c.; and, on the east, by the several islands bordering the mainland. The general depth in the channel is from 40 to 50 fathoms. The chief and most frequented of the southern entrances to it from the open sea, is that between Asinello on the north, and Premuda and Selve islands on the south; the second in importance is that between Selve and Ulbo; and, the next, that between Ulbo and Pago islands, which last is taken by vessels bound to the Zara channel.

**Lutostrak islet**, is about a quarter of a mile in diameter and 86 feet high; it lies about a mile off the northern end of Premuda island and is the southern boundary of the principal passage leading from the open sea to the Quarnerolo channel. It is bordered by a narrow bank, which, on the western side, extends nearly a quarter of a mile from it. Lat. 44° 22' N.  
Long. 14° 34' E.

The passage between Lutostrak islet and Gruica lighthouse, on the north, is  $2\frac{3}{4}$  miles wide; a short mile N.W. from the islet is an 8-fathoms patch with 20 fathoms close to it. North-eastward of this patch and  $2\frac{1}{2}$  miles N.E.  $\frac{3}{4}$  N. from Lutostrak islet, is the Levante bank with 5 fathoms. To pass southward of this bank, keep towards Gruica island or Lutostrak;

Chart, 2,711 [798].  
Var. 8° 30' W.

Morovnik islet shut in with the northern extreme of Selve island until Gruica lighthouse bears N.W. by W. leads southward of it. The Morovnik bank (page 160), farther eastward, is 7 miles E. by N. from Gruica lighthouse; when near it at night, keep the light clear of this bearing. For Gruica light and Selve bank, *see* page 144.

Between Lutostrak islet and the north-western horn of Premuda island, is Kamenjak, a smaller but rather higher islet than Lutostrak, it being 93 feet high. There are depths of from 6 to 23 fathoms between the two islets, and 4 fathoms between Kamenjak and Premuda.

**PREMUDA ISLAND** is about  $4\frac{3}{4}$  miles in length, three-quarters of a mile across, and its greatest height, near the middle, is 295 feet; it is thickly covered with bushes except in the neighbourhood of the town, which is towards the north-western end on the slope of the highest hill; it contains about 1,500 inhabitants.

The north-eastern coast is precipitous, affords no shelter, and the water is deep throughout. The northern end, with the islet of Kamenjak on the west and Medvjak point on the east, forms a bay, but the latter point is foul for about 2 cables in a N.N.W. direction.

**Anchorage.**—Vessels of any size may anchor during a Bora under the south-western side of Premuda island. Large vessels should anchor in about 33 fathoms, sand, nearly 2 miles from the shore, off the middle of the island; in port Premuda the bottom is mud.

**Ports Kreul and Premuda.**—The four small islets Bracic, Plika, Massarine, and Kripa, ranging from 9 to 28 feet in height, with some rocks connecting them, extend nearly  $1\frac{1}{4}$  miles parallel with the west side of Premuda, at about 2 cables from the shore, forming with it the channel named port Kreul, in which small vessels anchor in 2 to 4 fathoms, mud, abreast St. Ciriaco chapel, which is easily distinguished from the offing. With south-easterly winds, the current sets rapidly through this channel and between the rocks. There is also anchorage for small vessels with off-shore winds in port Premuda, a small bay south-eastward of port Kreul.

**SKARDA ISLAND** is 2 miles in length, rocky, barren, and covered with bushes; the most elevated part is a hill 356 feet high near the south-eastern extreme. The island is connected with the south-east end of Premuda by a ridge with  $5\frac{1}{2}$  to 10 fathoms water. The channel between them is a mile wide, but is frequently difficult owing to the rapidity of the current over the ridge, the water being 30 fathoms deep on either side of it. Mid-channel should be preserved, as the opposite points of the two islands are foul.

A shoal with  $3\frac{1}{2}$  fathoms lies S.W.  $\frac{1}{2}$  S. distant 8 cables from Suha point, the north-western extreme of Skarda, and a  $4\frac{1}{4}$ -fathoms patch 3 cables from its southern point.

**ISTO ISLAND**, nearly half a mile south-east of Skarda, is  $2\frac{1}{2}$  miles in length,  $1\frac{3}{4}$  miles in breadth, and is nearly divided in two by deep bays running in opposite to each other from the south-eastern and north-western ends. It is 570 feet high on its north-eastern side, and has the appearance of two islands when seen from the north-westward. The village of Isto,\* at the head of the bay on the south-eastern side, contains the few inhabitants of the island.

The north-eastern shore is nearly straight and there is a depth of 30 fathoms at 3 cables from it; the south-western side is bordered for a distance of  $1\frac{1}{2}$  miles by islets, rocks, and shoals, with deep water between and amongst them. There is no anchorage on any part of the coast, except in the two bays and even they are exposed.

Plan on  
1 561 [800].  
Lat.  $44^{\circ} 20' N.$   
Long.  $14^{\circ} 36' E.$

Chart, 2,711 [798].  
Lat.  $44^{\circ} 17' N.$   
Long.  $14^{\circ} 42' E.$

\*Lat.  $44^{\circ} 16' N.$   
Long.  $14^{\circ} 48' E.$

**In the channel** between Isto and Skarda, which has a central depth of 40 fathoms, navigation is rendered difficult by the numerous rocks and shoals in the approach to its entrance, as well as by the rapidity of the current. In proceeding through it, the whole of the group south-westward of Isto should be left to the eastward, but the north-westernmost of the rocks and islets should be closed so as to avoid the  $4\frac{1}{4}$ -fathoms patch off the southern point of Skarda.

Chart. 2,711 [798].  
Var. 8° 30' W.

**Kok shoal.**—Nearly one mile north-eastward of the eastern coast of Skarda, and about the same distance W. by N. from Kok point, Isto, is Kok shoal, a  $1\frac{1}{2}$ -fathoms patch\* with deep water all round; it may be avoided by keeping either Skardo or Isto aboard.

\*Lat. 44° 18' N.  
Long. 14° 44' E.

**Telegraph cables.**—There is a telegraph cable from Nozdre cove on the south-east side of Selve island to the head of Koziraca bay on the north side of Isto island, thence across the narrowest part of port Zapuntello, between Isto and Melada.

**MELADA ISLAND.**—**Port Zapuntello.**—Melada island, 6 miles in length in a north-west and south-east direction, and about  $2\frac{1}{2}$  miles in breadth, with a broken coast line, is separated from the south end of Isto by a very narrow channel 3 fathoms deep which leads to the small port of Zapuntello at the northern end of Melada, formed by the shores of the two islands. The deepest entrance to the port is from the eastward.

Lat. 44° 16' N.  
Long. 14° 48' E.

When seen from a distance Melada presents an irregular outline of barren or bush-covered hills, of which the highest near the middle of the island, is cone-shaped and 495 feet high; mount Knezak, north-west of Zapuntello village, is 466 feet high; the south-western point is 430 feet, and the hill at the eastern end 300 feet. The inhabitants may amount to about 300, mostly mariners and fishermen.

The north-western part of the island is bordered westward by several islets, rocks, and shoals, being a continuation of those fronting Isto island, of which Tramerka islet, 164 feet high, is the largest.

About half a mile west of the north end of Melada, there is a shoal with 6 feet water, marked by an iron pole beacon surmounted by a ball 18 feet above the water.

The north-eastern coast of Melada is irregular with several small islets and shoals lying off and projecting from it, the outer hidden danger being rather less than a mile from the shore; with the exception of port Manzo, (*see* page 159) there is no port or harbour on this coast.

**LIGHT.**—**Zapuntello.**—At 35 yards within Vrana point, eastern entrance to port Zapuntello, from an iron column 20 feet in height, is exhibited a *fixed white* light elevated 39 feet above the sea, visible in clear weather from a distance of 5 miles.

**BERGUGLIE BAY.**—This well-sheltered bay is formed by a tongue of land projecting in a south-south-westerly direction from the main portion of Melada, on its south-western side, and enclosing a space  $2\frac{1}{2}$  miles long and a mile wide at the entrance, gradually converging to its head.

Plan of port Berguglie on 1,561 [800].  
Lat. 44° 12' N.  
Long. 14° 51' E.

The bay has depths of from 10 to 20 fathoms, is well sheltered from all winds, and a considerable number of vessels of any size may anchor in any part of it, though it is not much used except by small vessels. The best berth is in about 9 fathoms, northward of Brguiski islet on the north-eastern side of the bay; well protected from strong south-easters.

Brguiski islet is connected with the shore by a flat, over which in the deepest part there is about 14 feet water.

Plan on  
1,561 [800].  
Var. 8° 30' W.

Lat. 44° 12' N.  
Long. 14° 50' E.

**Port Lucina.**—**Melada village**, where provisions may be obtained, is at the head of a little creek named port Lucina, on the eastern side at the entrance of Berguglie bay.

**Bonaster point**, the termination of the tongue of land forming the south-western side of Berguglie bay, is 430 feet high; at 3 cables from the shore and southward of it, is a shoal with  $5\frac{1}{2}$  fathoms water; and half a mile east-north-eastward but rather nearer the shore, is the Bonaster rock with 3 fathoms water in Settebocche channel, the approach to Berguglie bay from the westward.

**LIGHT.**—At the inner end of port Lucina, at 31 yards from the shore, a *fixed red* light is exhibited from the window of a white house, at an elevation of 29 feet above the sea, visible in clear weather from a distance of 8 miles, between the bearings N. 58° E. and N. 65° E. The light in sight leads clear of Bonaster point and of the Bacili islets but over the Bonaster rock.

**Golac islet.**—This islet, 118 feet high, is on the southern side of the entrance to Berguglie bay in Settebocche channel, the passage between Melada and Grossa islands; about a quarter of a mile south of Golac islet, lies Berstjak islet, with a one-fathom patch in the fairway between; Berstjak is connected with the north end of Grossa by a ridge with one foot water.

**LIGHT.**—On the north-west end of Tun Veliki island, eastern approach to Berguglie bay, at about 40 yards from the coast, stands a conical iron tower, painted white, 23 feet high, from which, at an elevation of 88 feet above the sea, is exhibited a *fixed* light, showing the following sectors:—*White* when bearing from S. 80° E. to S. 71° E.; *red* from S. 71° E. (southward of Bonaster rock) to S. 49° E. (over Golobinka point); *white* from S. 49° E., through south, to S. 7° W.; obscured from S. 7° W. to S. 41° W.; *white* from S. 41° W. to S. 51° W. (between Trata and Vrtlac islands); obscured from S. 51° W., through west, to N. 43° W.; *white* from N. 43° W., through north, to N. 48° E. (northward of Zverinac island); and obscured from N. 48° E., through east, to S. 8° E. The light is visible in clear weather from a distance of 9 miles.

Lat. 44° 11' N.  
Long. 14° 50' E.

**DIRECTIONS.**—**Settebocche channel**, the passage between Melada island and Golac islet, is about half a mile wide and is generally taken by vessels from the westward bound to Zara, the only difficulty being the rapid current. A vessel should bring Golac islet to bear about East and steer for it. Tramerka islet, northward of the passage, will be recognised by its double hill and bushy sides; and the position of the channel at night is indicated at a considerable distance by Bianche light on Grossa island, and, on a nearer approach, by the *red* arc of light from port Lucina when on the right bearing (between N. 58° E. and N. 65° E.) to see it. The Bacili islets, *see* page 168, and the  $5\frac{1}{2}$  and 3-fathoms shoals off Bonaster point at the entrance to Berguglie bay, should have a wide berth. The shoals are covered by the *red* light at Lucina.

To proceed through to the Zara channel, Golac islet should be left a short distance to the southward; then steer about E. by S. for the narrow passage between Tun Mali on the north, and Tun Veliki on the south, *see* view on plan 1,561; the passage is only about 2 cables wide, but the depth in it is from 15 to 17 fathoms. When past these two islets, the strength of the current requires that care should be taken to avoid Trata (eastward of Kamenjak), which two islets are connected by a ridge, and Vrtlac islets; the northern extremes of Tun Veliki and Zverinac islets

in line, lead nearly midway between them. A shoal extends  $1\frac{1}{2}$  cables north-westward from Vrtlac. Plan on  
1,561 [800].  
Var.  $8^{\circ} 30'$  W.

If bound to Berguglie bay, after following the directions for entering Settebocché channel, a vessel should give Bonaster point a berth of at least 4 cables, in order to avoid the  $5\frac{1}{2}$ -fathoms patch and the Bonaster rock of 3 fathoms before mentioned; or, if it is intended to pass within those shoals, round Bonaster point at the distance of  $1\frac{1}{2}$  cables, so as to pass midway between the rock and the point, thence to port Lucina, or to the head of Berguglie bay.

**Port Manzo** is a bay about three-quarters of a mile deep, situated  $1\frac{3}{4}$  miles north-west of Stopanja point, the south-eastern extreme of Melada; it is fronted by Asino islet, 78 feet high, under cover of which there is anchorage in a depth of 8 or 9 fathoms, mud. Lat.  $44^{\circ} 13'$  N.  
Long.  $14^{\circ} 52'$  E.

**SELVE ISLAND**, situated from 3 to  $3\frac{1}{2}$  miles north-eastward of Premuda island, is  $4\frac{1}{2}$  miles in length, nearly 2 miles in breadth at the northern part, where it is 262 feet high, whilst the southern part is 98 feet high, and the island being low in the middle has the appearance at a short distance seaward of two round islands sloping gradually towards the shore. It is tolerably cultivated and has a more fertile appearance than the neighbouring island; it contains about 1,100 inhabitants whose chief occupations are fishing and rearing cattle. The coasts generally are of little height and clear of danger. Chart, 2,711 [798].

**Telegraph cables.**—Selve island is connected with the southern end of Lussin by electric cable; and also with Ulbo, Puntadura, and Melada islands by cable from Nozdre cove near the south-eastern end of Selve. Anchorage is prohibited in the vicinity of the cables.

**Selve road** is a bay on the western side of the low land, about the middle of the island; it is a good anchorage in a Bora for vessels of any size. The best berth is in a depth of 11 fathoms, sand and gravel, good holding ground, about a quarter of a mile from the shore, with Selve church bearing E.S.E. Water and provisions may be obtained at the village. Lat.  $44^{\circ} 23'$  N.  
Long.  $14^{\circ} 41'$  E.

**LIGHTS.**—At San Antonio point, on the south-western side of Selve island, a *fixed white* light, elevated 28 feet above the sea, is exhibited from an iron support attached to the keeper's dwelling; it is visible in clear weather from a distance of 10 miles. Lat.  $44^{\circ} 21'$  N.  
Long.  $14^{\circ} 42'$  E.

A *fixed red* light, elevated 16 feet above the sea, visible 3 miles, is shown at port Zalic, Selve roadstead.

A small *fixed red* fishing light, visible one mile, is shown from Selve, on the east side of the island.

At Arat point, south extreme of Selve island, a *fixed red* light (unwatched) is exhibited from an iron framework, at an elevation of 52 feet above the sea, visible in clear weather from a distance of 8 miles. Shoal water extends about a cable southward of the light-structure.

**Pettini islets**, lying nearly in mid-channel between the south-eastern ends of Selve and Premuda, are three dark, barren, steep, narrow islets, from 128 to 170 feet in height, together extending over a space of  $1\frac{1}{2}$  miles in a north-west and south-east direction. Detached shoals with one fathom water extend three-quarters of a mile north-westward from their north-western extreme, and shoal water extends also a short distance from their south-eastern end.

Chart. 2,711 [798].  
Lat.  $44^{\circ} 18' N.$   
Long.  $14^{\circ} 44' E.$   
Var.  $8^{\circ} 30' W.$

**Krizice rocks.**—Midway between the south Pettini islet and the northern end of Isto island are the Krizice rocks; and, southward of these rocks, three-quarters of a mile from the northern end of Isto and the same distance from the shore of Skarda, is Kok shoal with  $1\frac{1}{2}$  fathoms water, before mentioned.

**ULBO ISLAND**, the next large island east of Selve island, is 5 miles in length north and south, and its extreme breadth is  $2\frac{1}{2}$  miles, but narrowing in the middle to three-quarters of a mile, the coast on either side forming a bay. Its northern end is 111 feet high, the greatest height of the southern part being 236 feet, and, like Selve, it sinks in the middle to low land. A considerable portion of the island is cultivated and cattle are reared. The village is on the western side.

Lat.  $44^{\circ} 25' N.$   
Long.  $14^{\circ} 45' E.$

**Shoals.—Buoy.**—Sib point, the north-western extreme of Ulbo, terminates in a long rock or islet 16 feet above water, and from it, shallow water extends about  $1\frac{1}{2}$  cables. A mile southward of Sib point is Kuriak islet surrounded by reefs, which also connect it with the shore.

On the north-eastern side of the island are the Fucin rocks, reaching half a mile off-shore, mostly sunken and steep-to.

A shoal, named Grisini muli shoal, extending three-quarters of a mile from Ploc point, the south extreme of Ulbo, terminates in a  $2\frac{1}{2}$ -fathoms patch marked by a white buoy surmounted with a ball, moored in a depth of  $3\frac{3}{4}$  fathoms. Elsewhere, at a prudent distance from the shore, the water is deep.

**Port Ulbo**, in the bay northward of Tale point, the west extreme of Ulbo island, is bounded northward by Kuriak islet and the shoals before described; it is exposed to winds from the N.W., but good anchorage may be obtained abreast the village, in a depth of 7 to 10 fathoms, sand and mud, at 3 cables from the shore. Small supplies may be obtained.

Tale point is bordered by shoal water and should not be rounded closely. With this exception, the point is separated from Selve island by a deep channel nearly three-quarters of a mile wide.

Lat.  $44^{\circ} 23' N.$   
Long.  $14^{\circ} 46' E.$

**LIGHT.**—From an iron post on port Ulbo molehead, a *fixed* light elevated 18 feet above the sea, is exhibited showing *red* when bearing from N.  $59^{\circ} E.$ , through east, to S.  $28^{\circ} E.$ ; *white* elsewhere. The *white* light is visible in clear weather from a distance of 3 miles, *red* at 2 miles.

**Morovnik islet and bank.**—Morovnik islet, situated N.W.  $\frac{1}{2}$  N. 8 cables from Sib point, is about 3 cables in diameter, 16 feet high and surrounded by shallow water; it should not be approached within 3 cables.

Lat.  $44^{\circ} 27' N.$   
Long.  $14^{\circ} 43' E.$

At  $1\frac{1}{2}$  miles N.N.W. from the centre of the islet is the rocky bank of Morovnik, about half a mile in extent, with a depth of 2 to 8 fathoms. The shoalest part is in line with Morovnik and Kuriak islets, and, from it, the north-western extreme of Selve island bears S.W.  $\frac{1}{2}$  W. distant  $3\frac{1}{2}$  miles; see also page 156.

**Ulbo channel.**—The islet and bank are on the eastern side of the Ulbo channel, leading to port Ulbo, and the islet is 2 miles from the shore of Selve island, which forms the western side of the channel. The channel is often taken by small vessels from Venice bound to Zara.

Lat.  $44^{\circ} 23' N.$   
Long.  $14^{\circ} 51' E.$

**Magresina (Planik) islet**,  $1\frac{1}{2}$  miles eastward of Ulbo, is  $1\frac{1}{2}$  miles in length, about a quarter of a mile wide, and 112 feet in height. A shoal extends about  $1\frac{1}{2}$  cables from its northern end. The north-eastern part of the islet is bare, the remainder is covered with bushes. The smaller islet of Magresina picc, 20 feet high, is half a mile south-eastward of Magresina, and the two are almost connected by shallow ridges extending from them.

**Poklib islet**, 26 feet high, is nearly midway between Magresina and Maon island, north-eastward of it. Poklib is nearly 2 cables in diameter; the passage on either side is clear of danger. Chart, 2,711 [798].  
Var. 8° 25' W.

**LIGHT**.—From a white iron conical tower 33 feet in height, on the summit of Poklib islet, a *fixed white* light (unwatched) is exhibited at an elevation of 51 feet above the sea, visible in clear weather from a distance of 7 miles. Lat. 44° 24' N.  
Long. 14° 54' E.

**Pago channel**, the passage next eastward of Quarnerolo channel, is formed by Arbe and Dolin islands on the north-east, and Laganj and Dolfin islets with the long narrow projection of Pago island on the south-west. The channel is everywhere clear and deep; it leads to the Morlacca channel and is used by vessels bound either to Arbe, or to Carlopago on the Croatian coast.

**PAGO ISLAND**.—This island is 32 miles in length and its extreme breadth is 5 miles, the widest part being at the southern end, but the coast line is very irregular and indented with bays and deep inlets; the northern part, for upwards of 10 miles, is a mere tongue of land on an average rather less than a mile across and from 300 to 450 feet high. Mount St. Vito, the highest point, near the middle of the island, is 1,142 feet above the sea. Charts,  
2,711 [798],  
2,774 [801].

Pago is one of the four large islands of the Quarnero group, but only a small portion, sheltered from northerly winds, is cultivated. Unlike Arbe, it is unprotected by high land north-eastward and its climate is comparatively severe in winter when it is frequently covered with snow and northerly winds sweep over it with extreme violence. There are not more than 5,000 inhabitants, most of whom dwell in the town of Pago. Lat. 44° 29' N.  
Long. 15° 0' E.

The chief products are salt, collected from numerous salt-ponds around a lake south-eastward of the town of Pago, honey, oil, and wine. Sheep and goats are reared in considerable numbers. Only the northern part of the island produces wood of any kind.

**Telegraph cables**.—A telegraph cable connects Pago and Arbe islands, leaving the former at Loni point, the north extreme of the island, and crossing to Ferkanjo point in the latter. Another cable connects Pago at Prutna point, the south extreme of the island, with St. Vito on the mainland.

**Eastern shore**.—Opposite the mainland, the coast is rocky, steep, and barren, with deep water at a short distance from it; strong northerly winds are frequent there, and, with the exception of Pago bay, it affords no shelter whatever.

**PAGO BAY**.—This so-called bay is in fact a land-locked basin more than 8 miles in length in a north-west and south-east direction, about 2 miles in breadth when within the entrance, and narrowing towards both ends. The entrance is on the north-eastern coast, near the middle of the island; it is open towards the south-east, and the land on the eastern side terminating in St. Christoforo point, overlapping by 1½ miles that on the western side, forms a passage nearly half a mile wide, called the Bocca di Pago. Lat. 44° 29' N.  
Long. 15° 1' E.

The basin is bordered by high land, more especially on the south-west, the shores are generally clear of danger, but in the northern part of the bay, on the south-western side about 3 miles from the western point of entrance, the shore is foul for some distance with rocks above water nearly in mid-channel; the shore eastward of these rocks is also foul, but there is a depth of 12 fathoms between. The village of Saska is at the north-western head of the basin, and, from it, this part is known as Saska bay.

Chart, 2,774 [801].  
 Lat. 44° 27' N.  
 Long. 15° 3' E.  
 Var. 8° 20' W.

**Pago.—Anchorage.**—The town of Pago is at the south-eastern head of the basin,  $2\frac{1}{2}$  miles southward of the entrance. Both shores here are bordered by a narrow bank, and the anchorage is midway between, and three-quarters of a mile from the church, in a depth of about 12 fathoms, mud. Vessels visiting the bay for salt, anchor farther in and secure to the shore. The passage to this inner anchorage has a depth of  $14\frac{1}{2}$  feet, and is marked by groups of posts painted black on the port hand when entering, and by groups painted red on the starboard hand. There is also anchorage in the small bay of Slana just within the entrance on the north-eastern side.

**Harbour light.**—A small *fixed white* light, elevated 18 feet above the sea, is exhibited at the north mole of the basin at port Pago, showing *red* when bearing from about S. 27° E. to about S. 13° E., in the fairway of the harbour; *white* elsewhere.

**St. Christoforo shoal.**—St. Christoforo point, on the eastern side of entrance to Pago bay, has on it an old chapel, and, at the foot of the point, and close to it, is a sunken rock. Nearly  $3\frac{1}{2}$  cables from the point, S.  $\frac{1}{2}$  E. from the chapel, is a rocky 2-fathoms shoal, steep-to all round. Three small rocks, also steep-to, will be seen off the inner point on the north side in entering.

**Light.**—A lighthouse is being built on St. Christoforo shoal.

**Directions.**—From the northward, there is no difficulty in entering Pago bay; St. Christoforo point should be passed at the distance of  $1\frac{1}{2}$  or 2 cables. In coming from the southward, in order to clear the Christoforo shoal of 2-fathoms, keep the western coast close aboard until St. Christoforo chapel bears eastward of N. by E., then steer in mid-channel.

**Pago, West coast.—Shoal.—Beacons.**—The long narrow north-western arm of Pago terminates sharply in Loni point, on which stands St. Martin's telegraph tower. At about half a mile W. by N. from this point there is a shoal with  $3\frac{1}{2}$  fathoms water; at 3 cables westward of it the depth is 7 fathoms, and at half a mile southward of the point lies Mata shoal covered with 4 feet water; this shoal is marked by a pole beacon with ball, painted white. From thence southward, the western coast is irregular, with several coves and deep water all along as far as Gaja point, a distance of 10 miles.

Gaja point is foul for 3 cables off-shore, and the coast bank, with several patches of  $4\frac{1}{2}$  to 10 fathoms, extends  $1\frac{1}{2}$  miles from the land as far south-eastward as Slatina bay. The village and church of Novaglia stands at the head of the little bay of the same name, on the southern side of Gaja point.

**Port Novaglia.—Light.**—At the landing place in port Novaglia, a *fixed* light is exhibited from an iron support at an elevation of 19 feet above high water, visible in clear weather from a distance of 3 miles, and showing *red* when bearing from S. 59° E. to S. 87° E., clear of the shoals on each side of the port; *white* from N. 17° E., through north and west, to S. 17° W.; obscured elsewhere.

**Slatina bay** is 4 miles south-eastward of Gaja point, and is formed by a bend in the coast and by an islet and shoal ground extending half a mile northward from its western point. The bay is open north-westward and there is anchorage in depths of from 6 to 9 fathoms, mud.

**Port Simoni**, a small inlet 3 miles south-eastward of Slatina bay, and 2 miles north-eastward of Maon island, is protected on all sides, and has a depth of from 6 to 9 fathoms, muddy bottom; its mouth is only about a cable wide, the northern point of entrance is foul, and a reef with 3 feet water lies about 20 yards off the second headland.

Chart, 2,711 [798].  
 Lat. 44° 42' N.  
 Long. 14° 44' E.

Lat. 44° 33' N.  
 Long. 14° 53' E.

Lat. 44° 28' N.  
 Long. 14° 57' E.

**Mandrie cove.**—Half way between Slatina bay and port Simoni is Mandrie cove with stone beacons on each side of the entrance. Chart, 2,711 [798].  
Var. 8° 20' W.

**SKERDA ISLAND**,  $1\frac{1}{2}$  miles south-westward of the western point of Slatina bay, Pago island, is a barren, bush-covered, rocky island,  $1\frac{1}{2}$  miles in length, and rising to a height of 174 feet. A shoal extends about 4 cables from its south-eastern extreme.

**LIGHT.**—On the north-west point of Skerda island stands an iron circular tower, 38 feet in height, painted red, from which, at an elevation of 49 feet above the sea, is exhibited a *fixed white* light, visible in clear weather from a distance of 8 miles. Lat. 44° 29' N.  
Long. 14° 51' E.

**MAON ISLAND**, rather more than three-quarters of a mile south-eastward of Skerda, is partly covered with bushes, is nearly 5 miles in length, and ranges from 80 to 210 feet in height; its northern and north-western end is bordered by a narrow bank. Vessels may take shelter from a Bora under its south-western coast in a depth of 7 or 8 fathoms, sandy bottom. Boats resort for refuge to coves in this shore.

One mile south-eastward of the southern end of Maon island lies Brunsjak islet, 59 feet high, and between the two is a smaller islet or rock, 23 feet high. Brunsjak is surrounded by shallow water, which extends 4 cables eastward of it, with a small rock half a cable from the shore. Lat. 44° 24' N.  
Long. 15° 0' E.

**Maon channel**, bounded by Skerda and Maon on the south-western side, and Pago island on the north-eastern side, is 10 miles in length, with an average width of  $1\frac{1}{2}$  miles; but, the south-eastern entrance is considerably contracted by the shoal extending eastward from Brunsjak islet and by the shoals extending westward from the shore of Pago island, the space between being little more than three-quarters of a mile. This channel, through which a rapid current flows and which is frequently visited by violent Bora gales, is seldom used, and is considered dangerous for sailing vessels, but is a good clear channel for steam-vessels.

**PAGO, West coast.—Port Cossion**, a bay about 2 miles south-eastward of Zaglava point, is about 2 miles in length and one mile wide, with a depth of from 8 to 15 fathoms, good holding ground. The shore of the bay is fringed by a bank to the distance of about  $1\frac{1}{2}$  cables. Chart, 2,774 [801].  
Lat. 44° 23' N.  
Long. 15° 5' E.

It affords good shelter to the largest vessels in northerly and easterly winds, but is exposed to those from South to W.N.W. There is a mooring buoy in the northern part of the port off a small pier near the Health office.

**LIGHT.**—A *fixed white* and *red* light, elevated 16 feet above the sea, is exhibited at 120 yards east of the molehead at port Cossion, and should be seen in clear weather from a distance of 4 miles. The sector of *red* light leads clear of the shoal extending from Cossion point, and is visible over the port.

**New Povljana port** is on the western side and towards the southern end of Pago island, 2 miles southward of the bay known as port Cossion, and at the north-western entrance of the New Povljana channel; it is open to north-westerly winds but sheltered from all others. It is customary for small craft to drop an anchor seaward and to secure to the shore against the Bora. A considerable swell at times sets in. The two points forming the bay are both shoal to a short distance.

The village of New Povljana stands on an eminence about 3 cables from the eastern shore of the port and marks its position.

**PUNTADURA ISLAND**, separated from the southern part of Pago island by the New Povljana channel, is  $5\frac{1}{2}$  miles in length, has an extreme breadth of  $2\frac{1}{2}$  miles, and the highest part, at the north-western end, is 404 feet above the sea; towards the south-east it is low and narrow,

Chart, 2,774 [801].  
Var. 8° 20' W.

and the island may be recognised by two flat-topped hills. Numerous flocks of sheep find pasturage, but with the exception of a plain near the middle of the island, in which is a village containing about 600 inhabitants, it is uncultivated and overgrown with bushes. The greater part of the shore of Puntadura is bordered by a narrow bank, and is only separated from the mainland of Dalmatia by the shallow and narrow Brevilacqua strait.

Chart, 2,711 [798].  
Lat. 44° 18' N.  
Long. 15° 0' E.

**Hochgrund.**—Nearly midway between Puntadura and Melada islands, a narrow ridge of sand, weed, shells, and coral, named Hochgrund, extends about 4 miles in a north-westerly direction; the depth is 9 fathoms at its south-eastern end and 6 to 8 fathoms at its north-western part, with 30 to 37 fathoms on either side.

**Telegraph cables.**—Puntadura is connected with the mainland by a telegraph cable through Brevilacqua strait; and also by cable with Nozdre cove, Selve island.

Chart, 2,774 [801].  
Lat. 44° 18' N.  
Long. 15° 2' E.

**LIGHTS.**—On the west side of Puntadura, 34 yards within the coast line, are exhibited two *fixed white* lights placed vertically, elevated 54 and 24 feet above the sea, and visible, respectively, in clear weather from the distance of 12 and 9 miles. The lights are shown from a brick tower, with two-storey dwelling attached, and are visible when bearing from N. 32° W., through north and east, to S. 20° E.

**Anchorage.**—A depth of 9 or 10 fathoms, muddy bottom and good holding ground, extends along the coast for about 2 miles southward of Puntadura point, the north-western point of the island. This locality is well protected by high lands from the Bora. A large vessel should anchor in 9 to 14 fathoms, rather more than 2 cables from the shore, with the highest part of the island bearing about E. by N.

There is excellent anchorage also sheltered from all winds in the large bay on the southern side of the island. Large vessels should anchor in the middle of the bay, half a mile from the shore, in a depth of from 9 to 12 fathoms, mud. Small vessels anchor eastward of Kosiak point, off Prezida cove.

Brevilacqua anchorage, in the same bay, is off the entrance of Brevilacqua strait, in 8 or 9 fathoms, mud, at a long half mile from either shore.

**Brevilacqua strait** is a narrow boat passage between Puntadura island and the mainland of Dalmatia, with precipitous sides which at the eastern entrance almost join; the depth at low water is only about one foot.

Lat. 44° 20' N.  
Long. 15° 5' E.

**NEW POVLJANA CHANNEL**, between Puntadura and the south-western part of Pago, leads from the Quarnerolo channel to the north-westward, to Nona bay, old Poveljana and other bays southward of Pago, which are approached from the eastward by Ljubaz channel, between Pago and the coast of Dalmatia, pages 165, 166. It is narrow, and near the south-eastern end is still further contracted to a width of about 2 cables and a depth of 4 fathoms, by shoals bordering the islands on either side. The current always sets north-westward through this channel.

Lat. 44° 17' N.  
Long. 15° 9' E.

**LIGHT.**—On Suca Prutina, in a depth of 1½ fathoms, from an iron framework, painted red, on masonry base, a *fixed red* light (unwatched) is exhibited at an elevation of 27 feet above the sea; the light is visible in clear weather from a distance of 5 miles, when bearing from S. 32° E., through east and north, to S. 88° W.

**Beacon and Buoy.**—The narrowest part of the New Poveljana channel is marked by a beacon consisting of an iron staff surmounted by two discs placed cross-wise and an iron flag, the whole painted white; the beacon stands in 9 feet water on the shoal extending from Pago island.

On the southern edge of the same shoal, south-westward of Prutna point, is a white buoy with staff and ball in 3½ fathoms; from it, the beacon bears N.W. by W. about one mile, and the nearest land just

westward of Prutna point is 3 cables distant. Both beacon and buoy may be passed close to on the port hand when coming from the north-westward. Chart, 2,774 [801].  
Var. 8° 20' W.

**PAGO, South coast.**—Old Poveljana bay is a deep inlet on the south-eastern coast of Pago island, with depths of 18 to 13 and 7 fathoms. Its south-eastern point is prolonged by the islets Rocco and Zikovac having a narrow 3-fathoms channel between each other, and also between Rocco islet and Pago. This point with the islets projects into Ljubaz bay on the mainland, whilst the western part of Ljubaz bay, with Misniak islet at its head, projects well within the entrance of Old Poveljana bay. Lat. 44° 19' N.  
Long. 15° 10' E.

Vlasic cove and Dinjiska bay, also in the south-eastern end of Pago, are eastward of Old Poveljana bay; the latter inlet though only 7 cables wide at the entrance, with a depth there of 23 fathoms, recedes 4 miles in a north-westerly direction, becoming very narrow and with only from 3 fathoms to one fathom in its inner half. The south-eastern point of this bay forms the northern side of Ljubaz channel described at page 166.

**Nona bay.**—This bay in the mainland, at the north-western extreme of Dalmatia and at the south-eastern end of the New Poveljana channel, is about 2 miles in length and 1½ miles wide; its shores are bordered all round by shallow water.

The anchorage is about a mile from the head of the bay and about 6 cables from the eastern shore, in a depth of 7 or 8 fathoms; small vessels anchor farther in abreast St. Giacomo church about 3 cables from the shore, in about 4 fathoms. The Bora is violent here.

The town of Nona (ancient *Enona*), is in the middle of an unhealthy swamp and communicates by a causeway with the mainland. It was formerly a place of importance, though it now contains but 650 inhabitants. Water may be obtained.

**Ljubaz bay.**—This bay in the Dalmatian coast is separated from that of Nona by the peninsula before mentioned which extends into the entrance of Old Poveljana bay, and has on its western side the little port of St. Lorenzo. Ljubaz bay is about 2½ miles wide and 3 miles deep. Ljubaz castle stands on a projecting headland which divides the head into two bays; the village of Ljubaz is in the western bay and there is anchorage off it in a depth of 6 to 8 fathoms. Lat. 44° 17' N.  
Long. 15° 16' E.

Communication between Nona and Old Poveljana or any of the other bays just described, or with the Morlacca channel by Ljubaz strait, is simple and only requires careful reference to the chart.

**MORLACCA CHANNEL.**—In continuation of the description of the Morlacca channel, *see* page 151, it may be repeated that the Croatian coast is steep and rocky, backed within a mile of the shore by the high mountainous range of the Velebit Gebirge, and affords but little shelter, though between Lukovo and Jablanaz, 9½ miles farther south, are many small coves available for boats. Chart, 2,711 [798].

**Jablanaz.**—The town of Jablanaz is at the head of a little bay in which small vessels may take refuge, but from the proximity of the well-sheltered anchorage in the Barbato channel, between Dolin and Arbe islands, it is seldom used. Lat. 44° 42' N.  
Long. 14° 54' E.

The gradual approach of the south-eastern end of Arbe island towards the mainland here contracts the Morlacca channel to less than a mile in width, and the Glavina bank with a least depth of 6 feet (marked by a beacon, *see* page 154) should be carefully avoided by vessels using this channel when steering for the anchorage in Barbato channel.

Chart. 2,711 [798].  
Lat. 44° 42' N.  
Long. 14° 54' E.  
Var. 8° 15' W.

**LIGHTS.**—On the northern side of Jablanaz bay, about 40 yards from the shore, from an iron frame attached to keeper's dwelling, is exhibited, at an elevation of 150 feet above the sea, a *fixed white* light, visible in clear weather from a distance of 12 miles.

Also, on the northern side of entrance to the inner part of the bay, about 20 yards from the shore, is shown a *fixed red* light, visible 2 miles.

**Prisna.—Beacon.**—Between Jablanaz and Carlopago, about 13½ miles farther south-eastward, there are no places of shelter for anything larger than boats; but just northward of Prisna, a little boat harbour 6½ miles south-eastward of Jablanaz, a rocky shoal extending a short distance from the shore is marked by a conical stone beacon at its edge, painted vertically in red and white stripes.

Chart. 2,774 [801].  
Lat. 44° 31' N.  
Long. 15° 4' E.

**Carlopago**, is another small bay open to southerly winds. The anchorage is close within the south entrance point, and as the space is confined, it is customary to make fast to the shore. A sunken rock lies at the foot of the northern point. The channel between it and Pago island is rather more than a mile wide, but heavy weather at times renders it impracticable for several successive days.

The town and church of Carlopago is on the northern point, which, extending in a southerly direction, forms one side of the bay; it is a small town containing about 750 inhabitants. Cistern water may be obtained at the town.

**LIGHT.**—On the mole-head at Carlopago, at an elevation of 19 feet above the sea, a *fixed white* light is exhibited, visible in clear weather from a distance of 8 miles. During a Bora the light cannot be shown.

**Telegraph.**—There is a telegraph station at Carlopago.

**Aspect.—The Coast** southward of Carlopago, like that northward of it, is still without any shelter whatever, except a few coves and inlets fit for small coasting boats. The peaks of the Velebit Gebirge range here rise to a great height close to the coast; that of Budim, 2 miles south-eastward of Carlopago and only one mile from the sea, being 2,503 feet high, whilst within 3 to 5 miles of the shore between this and the southern end of the Montagna channel, the continuation of the Morlacca channel, are Golc-vrch, 4,760 feet high; Velika Visocica, 5,308 feet high; Visujuna, 5,351 feet high; and Sveto-brdo, 5,774 feet high.

Lat. 44° 20' N.  
Long. 15° 19' E.

**Montagna channel.**—Beyond the south-eastern end of Pago island, the Morlacca channel continues south-eastward as the Montagna channel, which terminates in the Fiumera canal about 26 miles south-eastward of Carlopago. The current caused by the waters of the Zermanja river, discharged into the Mare di Novegrad, is often rapid in this part.

**Lights.**—On **Duga point**, west side of entrance to Kruzica cove, about 2½ miles northward of the Razance islets, a *fixed red* light is exhibited, elevated 19 feet above the sea, and visible from a distance of 2 miles.

It is intended to establish a *red* harbour light at Sibuljina point, on the coast of Croatia, about 1½ miles south-eastward of Duga point.

Lat. 44° 20' N.  
Long. 15° 16' E.

**Ljubaz strait**, at the south-eastern extreme of Pago island, is a narrow winding passage between it and a projection from the coast of Dalmatia, about 3 miles west-north-westward of the Razance islets. The land on each side is high and precipitous.

The depth through the strait is from 13 to 30 fathoms; the current from the Mare di Novegrad, accelerated by the waters of the Zermanja,

sets strongly south-westward through it, and the Bora blows with violence at times. This strait leads to the several bays, already described, between the southern end of Pago and the Dalmatian shore, which bays are generally visited by coasting vessels only. Chart. 2,774 [801].  
Var. 8° 15' W.

**LIGHT.**—On the eastern shore of the southern entrance to Ljubaz strait, a *fixed white* light (unwatched) is exhibited, at an elevation of 27 feet above the sea, from an iron column, painted red, on masonry base; the light is visible in clear weather from a distance of 8 miles, between the bearings of N. 15° W., through north and east, to S. 55° W.

**Razance islets.**—In the middle of the Montagna channel, and about 3 miles from Ljubaz strait, separating the south-eastern extreme of Pago island from the mainland, are the three low islets of Razance. Shoal water extends north-westward of the eastern islets and south-westward of the western islet; two detached patches also lie south-eastward of the latter islet and south-westward of the former. Lat. 44° 19' N.  
Long. 15° 21' E.

**Venier castle** stands on the south shore of Montagna channel, 6 miles south-east of Razance islets. A shoal situated half a mile north-westward of the castle is marked by an iron-pole beacon in 8 feet water, surmounted by two triangles with the points together.

**LIGHT.**—From the head of the mole at Venier castle a *fixed* light is exhibited, at an elevation of 18 feet above the water, visible in clear weather from a distance of 5 miles, and showing *red* when bearing from S. 43° E., through south, to S. 17° W.; *white* elsewhere.

**Fiumera canal.**—This very narrow channel, about  $1\frac{3}{4}$  miles in length, leads from Morlacca channel to the Mare di Novegrad, and carries throughout depths of from 10 to 18 fathoms to within a few yards of the shores, which are from about 50 to 100 feet high, the land on the western side, near the shore and about the middle of the channel, rising to 348 feet above the sea. The canal presents a picturesque appearance. Lat. 44° 15' N.  
Long. 15° 31' E.

On either side the entrance points are encumbered with shoal water, consequently it is not easy of access for large vessels. In summer, the wind generally blows up the strait by day and down by night.

**Mare di Novegrad** is a fine basin surrounded by well-wooded hills; it is about  $5\frac{1}{2}$  miles in length east and west, and from one to  $2\frac{1}{4}$  miles in width, with depths of from 8 to 15 fathoms, muddy bottom. The town of Novegrad is on the southern side of the basin, and defended by a fort, but is of little importance. Lat. 44° 12' N.  
Long. 15° 32' E.

**Telegraph.**—There is a telegraph station at Novegrad.

**Posedaria** is at the western end of Mare di Novegrad; the channel, about 10 feet deep, leading to the wharf, is marked by four groups of piles surmounted by discs, two of which mark the entrance and the other two the southern edge of the channel.

**The Zermanja**, one of the chief rivers of Dalmatia, rises in the mountains of Croatia, receives the waters of the Kruppa river, and flows into the Mare di Novegrad on its north-eastern side.

The fairway of the river is marked by pole beacons, black on starboard side entering, white on port.

**Mare di Karin** is a nearly circular basin about  $1\frac{1}{4}$  miles in diameter, bordered by high hills, southward of and connected with the Mare di Novegrad by a narrow passage, similar to the Fiumera canal, but not so deep. It is visited by boats only. Lat. 44° 9' N.  
Long. 15° 37' E.

## CHAPTER VI.

COAST OF DALMATIA FROM ABREAST OF THE SOUTH-EASTERN  
END OF PAGO ISLAND TO PORT ROGOZNICA.

Charts, 2,711 [798],  
2,774 [801].  
Var. 8° W.

**The COAST of Dalmatia** commences in about lat. 44° 22' N., the boundary line between Croatia and Dalmatia on the sea shore being marked by the church of Maddalena, which stands at the head of the cove of that name. It extends southward as far as the vicinity of Lastua castle, in lat. 42° 12' N., and has numerous indentations, affording good anchorage, with many off-lying islands and rocks, and deep water near the shore; the Bora often blows with great violence.

Dalmatia is a mountainous country; it is traversed by the Dinaric Alps, of which the most remarkable chain is that of Montenegro, which stretches from the Alps to the Archipelago, and consists of steep and barren heights rising about 3,000 feet above the level of the sea. The heights bordering the shore at a short distance are generally bare and precipitous, with well cultivated bases seaward. In the interior are extensive forests of oak, fit for ship-building; those formerly near the shore have been exhausted.

The inhabitants, about 450,000 in number, live chiefly by agriculture and seafaring pursuits, and under a settled government, are reported to have become a kindly and hospitable people. Wine, oil, corn, figs, almonds, salt, wood, salt fish, &c., are exported in small quantities. Water is generally scarce.

The Department of Zara and Sebenico includes the coast between Brevilacqua strait\* and Planka point to the south-eastward, an extent of about 60 miles, together with various islands and rocks.

**GROSSA ISLAND** is about 25 miles in length, north-west and south-east, and its width varies from one to 2½ miles, the coast line on the north-eastern side being irregular, with a deep indentation in the direction of the island, both at its north-western and south-eastern ends.

Its north-western extreme consists of low rocky land, of whitish appearance; from thence, the height increases southward in a line of ash-coloured rocky elevations; the highest part, mount Vela Straza\*, 1,109 feet high, is a little south-eastward of the middle of the island where it is just one mile wide. There are about 3,160 inhabitants; the chief trade is in salt fish, firewood, and salt procured from lake Comna at port Tajer. The only villages are on the north-eastern extreme of the island.

**Telegraph cables.**—Grossa is connected by a telegraph cable, with Eso island, and thence via Uglian island, with Zara on the mainland.

**LIGHT.**—On Bianche point, the north-western extreme of Grossa island, is a conspicuous white circular lighthouse, with green lantern, 133 feet in height, from which is exhibited at an elevation of 134 feet above the sea, a *fixed and flashing white* light, with a period of *two minutes*, showing *fixed, seventy-five seconds*; partial eclipse, *seventeen seconds*; flash, *eleven seconds*; partial eclipse, *seventeen seconds*. The light is visible in clear weather from a distance of 17 miles; *see view on plan*.

**Bacili islets.**—These two islets, previously mentioned at page 158, are perfectly flat, the outer 13 feet, the inner and larger of the two only 8 feet high; they are surrounded by shoal water, and should be given a

\*Lat. 44° 17' N.  
Long. 15° 8' E.

\*Lat. 44° 0' N.  
Long. 15° 3' E.

Plan of port  
Lungo on 1,561  
[800].  
Lat. 44° 9' N.  
Long. 14° 49' E.

berth of half a mile on their eastern side; the outer or northern islet bears N.N.W.  $\frac{1}{2}$  W.  $1\frac{1}{2}$  miles from Bianche point lighthouse. The shoal water extends 4 cables eastward of the islets, and it is connected with the shoal ground round the north-western end of Grossa island by a ridge with  $3\frac{1}{2}$  to  $4\frac{1}{2}$  fathoms.

Plan of port  
Lungo on  
1,561 [800].  
Var.  $8^{\circ} 20'$  W.

**PORT LUNGO**, eastward of Bianche point and the Bacili islets, affords shelter to small craft in a depth of 10 fathoms, sand, about half a mile from San Giacomo village, at the head of the port.

Lat.  $44^{\circ} 9'$  N.  
Long.  $14^{\circ} 52'$  E.

In proceeding to this anchorage, whether passing northward or southward of the Bacili islets, a good berth should be given to the shore between the lighthouse and Oklucie point, the western point of entrance, where it is bordered by shoal water for more than 2 cables. Having opened the village, steer for it, but avoid the western shore, where a long rocky ridge, with a narrow passage on each side of Baricev islet at its end, separates port Lungo from Pantera cove: the latter appears from the plan to be a snug anchorage for small craft in a depth of 7 fathoms.

**Buoy**.—On the rocky ridge extending south-eastward from Oklucie point, and distant nearly  $2\frac{1}{4}$  cables therefrom, there is a buoy with staff, in a depth of 10 feet.

The south-western coast of Grossa island is rocky and inaccessible. Taler islet, 13 feet high,  $5\frac{1}{2}$  miles south-eastward of Bianche lighthouse and half a mile from the shore, and the Misnjak, a small, rocky, 4-fathoms bank about a mile southward from this islet, are the only outlying dangers.

Charts, 2,711 [798]  
2,774 [801].

**Anchorage**.—Vessels may anchor for protection from a Bora along the south-western coast, at from half a mile to 3 miles from the shore, in about 36 fathoms, sand. The places ordinarily preferred are from abreast of mount Vela Straza to within about 3 miles of Taler islet, and also between the latter and Bianche point. The anchor should be weighed as soon as the gale permits. The soundings farther southward are deep close in to the island.

**PORT TAJER**, at the south-eastern end of Grossa island, is surrounded by barren hills of moderate height, and is one of the best ports in this part of the Adriatic; but though  $4\frac{1}{2}$  miles in extent from the entrance to its head, it has neither town nor village on its shores. It consists of several basins communicating with each other, and has sufficient space for a considerable number of vessels in depths varying from 7 to 27 fathoms, generally sandy or mud bottom.

Plan of port  
Tajer on chart,  
2,774 [801].  
Lat.  $43^{\circ} 53'$  N.  
Long.  $15^{\circ} 12'$  E.

The anchorage in the first of these basins is northward of the two small islets Galiola and Korotan, in a depth of 29 fathoms sand; or a vessel may anchor with Korotan, the outer islet, bearing N.W. by W. about half a mile, in 33 fathoms, mud. Small craft frequently anchor on the north-western side of Katena island, near which is a little islet or rock: and, W. by S. of the latter, is a shoal with 12 feet water, on which is erected a square beacon of masonry  $15\frac{1}{2}$  feet high.

The passage to the second basin, named Tripuljak bay, is along the south-western shore, leaving Galiola and Korotan islets and a  $2\frac{1}{2}$ -fathoms shoal in line between them and Gozdenjak islet, on the starboard hand, the channel between the latter and the south-western shore being about 2 cables wide. The depth in the southern part of Tripuljak bay is from 12 to 16 fathoms, but in its north-western part is a shoal with 2 fathoms water.

The third basin is beyond and northward of the second, and has no hidden dangers; it is about 8 cables long by 5 cables wide, and vessels

Plan of port Tajer  
on chart 2,774  
[801].  
Var. 8° 20' W.

anchor in about 11 fathoms south-eastward of Fafarikulac islet, which will be seen on entering.

The fourth and most secure of the basins is at the head of the port, and has a depth of from 7 to 8 fathoms southward of the two bare islets in its north-western part; it is perfectly sheltered, and here vessels may safely heave down for repair. North-westward of the two islets the depth is generally under 3 fathoms.

Neither water nor provisions are procurable at port Tajer.

Lat. 43° 51' N.  
Long. 15° 12' E.

**LIGHT.**—At 65 yards within the north-western extreme of the larger Sestrice island, at the entrance to port Tajer, is an octagonal iron tower 85 feet high, painted in red and white spiral bands, from which is exhibited at an elevation of 156 feet above the sea, a *fixed* and *flashing* light, with a period of *one minute*, showing *red* and *white* flashes alternately every *half minute*, visible in clear weather from a distance of 17 miles; see view on chart, No. 2,774.

**Directions.**—Port Tajer is not difficult of access, for, although numerous islands lie in the approach, all are clear of hidden dangers. Belvedere point should be given a berth of about one cable. Four islets lie off the entrance—the Sestrice islets south-eastward, and the two Germinjak islets north-westward. The larger of the Sestrice and the larger of the Germinjak islets are the nearest to Belvedere point, the north-western point of entrance, except the Tajer rock, 6 feet high, which is about 2 cables westward of that point and has a flat trencher-like appearance, from whence its name. The Sestrice with the Abatuta islets should be left on the starboard hand in entering, and a course steered northward to pass between them and the land within Belvedere point until the narrow entrance to the port is opened, after which the chart must be the guide for whichever of the four basins it may be desired to anchor in.

A 5-fathoms patch lies in line between Sestrice lighthouse and the western extreme of Abatuta, a third of a mile from the light.

There is a boat channel with 6 feet water leading eastward from port Tajer to Zut channel, between Katena and Incoronata islands; it is named the Great Proversa channel; the difficulty of the channel is often increased by the current which sometimes sets strongly to the south-west. A small stone beacon marks a 3-foot rock on the Proversa grande shoal in the bay formed between Katena, Buc, and Incoronata islands, eastward of Katena.

**COAST.**—The north-eastern coast of Grossa island has many bays, with numerous off-lying rocks and islets; in navigating amongst them the chart is the best guide. The only anchorage suitable to vessels of moderate size is that inside Kerknata islet, in a depth of about 10 fathoms, sand, Zlagavir village, on an eminence opposite Kerknata, is a good mark; it is about 5½ miles from the south-eastern end of Grossa.

**Sale cove.**—The village and cove of this name is about 3½ miles from the south-eastern end of Grossa, and opposite the northern end of Laudara island; it is occasionally visited by coasters, and has a small mole.

**Light.**—From the mole end at Sale cove a *fixed red* light is exhibited at an elevation of 18 feet above the sea, visible in clear weather from a distance of 3 miles.

**LAUDARA ISLAND**, 288 feet in height, and about 2 miles in length, lies parallel to and at one mile distant from the coast of Grossa southward of Sale cove.

**A rock**, with less than 6 feet water, lies between its lighthouse and Mertenjak islet north-west of it.

**Light.**—On the north extreme of Laudara island, abreast Sale cove, a *fixed white* light is exhibited at an elevation of 17 feet above the sea, visible 4 miles.

Lat. 43° 53' N.  
Long. 15° 13' E.

Chart, 2,774 [801].

\*Lat. 43° 56' N.  
Long. 15° 10' E.

**Luski** or **Luka** island, 230 feet high, under mount *Vela Straza*, and parallel with the shore, forms, with a projecting point to which it is nearly joined, an inlet about a mile deep and a quarter of a mile wide, with depths of from 8 to 20 fathoms. The village and church of *Luka* are at the head of the inlet; no supplies can be obtained. The telegraph cable crosses from *Luka* to *Dumbarca* bay, *Eso* island.

Chart, 2,774 [801].  
Lat. 43° 59' N.  
Long. 15° 5' E.  
Var. 8° 15' W.

*Rava* island, northward of *Luka*, is well cultivated, with a village and church on its central and highest part, and may be safely passed on either side. Coasters anchor south-westward of *Rava*, and under various other islets on the north-eastern coast of *Grossa*.

**INCORONATA ISLAND.**—This island is more than 13 miles in length and  $1\frac{1}{2}$  miles in extreme breadth, becoming very narrow to the southward, where it diminishes in one place to about a cable across. It may be said to form a continuation of *Grossa* island, and, at a distance, appears as a range of whitish conical hillocks, resembling the points of a diadem, hence its name. The highest of these hills, mount *Veli Vrch*,\* about one-third from the northern end of the island, is 774 feet above the sea, and mount *Opat*, at the southern extreme, is 328 feet.

\*Lat. 43° 50' N.  
Long. 15° 17' E.

A continuous chain of islets, rocks, and shoals, with deep water between and amongst them, borders the whole south-western coast of *Incoronata* island, the islets ranging to nearly 400 feet in height. Northward of the narrow portion of the island, there are numerous anchorages for coasting vessels, but the navigation of these localities is very difficult for strangers, especially as the current sets rapidly through the passages. Most of the dangers here are, however, a little above water. Between the two *Rasip* islets, which is one of the widest openings, there is a shoal with 2 feet water.

Lat. 43° 47' N.  
Long. 15° 17' E.

A short distance outside the chain of islets there is a considerable depth, and one mile outside them there is everywhere more than 50 fathoms.

The group of islets and rocks to the southward and abreast of the southern end of *Incoronata* are not safe to approach as there is no anchorage whatever near or amongst them, except in the small and unfrequented port of *Zakan*, about  $1\frac{1}{2}$  miles W.S.W. from the south-eastern extreme of *Incoronata*; here there is anchorage in a depth of from 10 to 15 fathoms, sand.

**Kurbavela islet.**—This narrow islet,  $2\frac{1}{2}$  miles in length and 387 feet high, is the south-easternmost of the group lying off the southern end of *Incoronata*; its rounded hillocks are rather lower than the neighbouring islet of *Skulj* north-westward of it.

**LIGHT.**—**Lucietta islet.**—On the summit of *Lucietta*, the south-western islet of the group westward of *Zuri* island, stands a stone lighthouse 70 feet high with dwelling attached, from which at an elevation of 126 feet above the sea, is exhibited a *fixed white* light varied by a *flash of two seconds every half minute*, visible in clear weather from a distance of 17 miles; see view on chart, No. 2,774.

Lat. 43° 37' N.  
Long. 15° 34' E.

**Directions.**—The whole space between the south-eastern end of *Incoronata* and *Zuri* island, is occupied by scattered islets, rocks, and shoals, with deep water between and among them and it is impossible to give any special directions for its navigation, especially as the currents are often strong; the chart and the eye must therefore be the guide. A vessel will, however, if wishing to proceed into the *Zuri* channel, avoid all risk from known dangers by bringing *Lucietta* lighthouse to bear

Chart, 2,774 [801].  
Var. 8° 20' W.

N. by E., and then, steering for it, pass on either side and bring it to bear S. by W. and keep it on that bearing. This line leads about 7 cables eastward of Sedlo islet and of the Botticella rock, 3 feet high, nearly the same distance westward of the Nodre rock, 26 feet high, and clear of the other islets into the Zuri channel. For Zuri island, *see* page 182.

Lat. 43° 51' N.  
Long. 15° 18' E.

**ZUT CHANNEL.**—The whole north-eastern coast of Incoronata consists of inaccessible cliffs; the opposite coast of Zut island is also steep. The depth in the middle of the passage is about 38 fathoms, sand and shells, and there is scarcely anchoring ground along the shore of Zut for the smallest vessel. If a sailing vessel from the eastward should be obliged to take this channel she should at once close one of the two islands, and pass either on the port or starboard hand, as the case may be, of all the islets, rocks, and shoals near the middle of the entrance.

Lat. 44° 0' N.  
Long. 15° 15' E.

**MEZZO CHANNEL**, with general depths of 30 to 40 fathoms, is a continuation of the Quarnerolo channel, with which it communicates by various narrow passages between the islands; it contains many islets, rocks, and shoals, and is little frequented, preference being given in fine weather to the passage outside the islands, and, under other circumstances, to the Zara channel.

Chart, 2,711 [798].  
\*Lat. 44° 11' N.  
Long. 14° 50' E.

For vessels approaching from the westward by the Settebocche channel (page 158, plan on 1,561 [800]),\* between the south-western end of Melada island and Golac islet, off the northern end of Grossa island, there are three passages to the Mezzo channel:—The first is between the northern end of Grossa and Zverinac the next island east of it; in taking this passage, Zverinac should be kept close aboard at the northern entrance to avoid the shoals extending to mid-channel off the coast of Grossa island. The second passage is between Zverinac and Tun Veliki island, a little over a mile east of it; at the southern end of this passage, a shoal with 2½ fathoms water lies in mid-channel; either side of the passage should be kept aboard to avoid it. The third passage, which is wide and clear, is between Tun Veliki and Sestrunj, the next island east of it.

Entering the Mezzo channel from the Quarnerolo channel, either of the three passages just described may be used, as well as a fourth, between Sestrunj island and Rivanj and the Tre Sorelle islets, a short distance east of it; the bottom here is rocky and anchorage indifferent. There is also a narrow 3½-fathoms passage between Rivanj island and the north-western end of Uglian, through which a strong current sets.

**LIGHTS.**—*See* Tun Veliki, page 158, Eso Grande, Arta point and Karantunic, page 174; Kosara, page 175.

**The Tre Sorelle islets**, or Three Sisters, of which the northern islet is 82 feet high, extend nearly 2 miles in a north-westerly direction from Rivanj island, and 3 cables beyond them in the same direction is a sunken rock with a depth of 2 feet, but with deep water between it and the islet and close to all round.

**A beacon**, consisting of an iron perch surmounted by two discs placed crosswise, painted white, 19 feet high, stands on the centre of this rock.

At one mile farther north-westward, in the same line, and about 4 cables from the shore near the northern end of Sestrunj, is a shoal with 2½ fathoms.

Chart, 2,774 [801].

Between Eso and Uglian islands, the only hidden danger is a sunken rock, which is marked by a beacon, about 3½ cables from the shore of Eso, and 2½ cables north-north-westward of Knezak islet.\* Farther southward, between Incoronata and Pasman islands, the middle of Mezzo

\*Lat. 44° 2' N.  
Long. 15° 8' E.

channel is so filled by islands, islets, rocks, and shoals as to be impracticable except for boats, therefore, in continuing southward from Eso island, the passage through the Mezzo channel is along the shore of Pasman island, between it and Sit island, and the eye and chart should be the guide. Chart, 2,774 [801].  
Var. 8° 20' W.

Zut and Sit islands are the most important of the islands blocking this channel; they are of sterile aspect but afford pasturage to numerous flocks of sheep.

**LIGHT.**—On the southernmost of the Tre Sorelle islands, a *fixed* Chart, 2,711 [798].  
*red* light, elevated 40 feet above the sea, and visible in clear weather from a distance of 10 miles, is exhibited from a tower over a one-storey house. The light is obscured from the bearing N. 25° E., through east, to S. 32° E., over the Tre Sorelle islands; also between S. 53° W. and S. 62° W., over Saida shoal. It is reported that the light shows faintly over the above shoal at 3 miles distance.

**Anchorage.**—Shelter from a Bora may be obtained about 1½ cables south-westward from the centre of either of the two northern islets of the Tre Sorelle in a depth of 9 or 10 fathoms, sand; but this anchorage is exposed to south-easterly and north-westerly winds, and the current is strongly felt. There is also anchorage between the northern end of Rivanj and the coast of Sestrunj.

**Sestrunj island**, from 500 to 635 feet high, is nearly 6 miles in length with an average width of about three-quarters of a mile. It is the highest of the islands in the neighbourhood, and is covered with bushes, except in the cultivated space around the village, which is one-third from the southern end of the island; shallow water extends a quarter of a mile off the north-western extreme. The island of Rivanj and the Tre Sorelle islets and dangers just mentioned are off its north-eastern side; the Paranchi, two small islets, are off its south-eastern end.

**Rivanj island**, between Sestrunj and the northern end of Uglian, Chart, 2,774 [801].  
Lat. 44° 11' N.  
Long. 14° 58' E.  
is 2¼ miles in length and 374 feet high, with a church on its summit at the centre of the island.

**Saida shoal.**—This danger lies N.E.  $\frac{3}{4}$  N. about a mile from the north extreme of Rivanj island. It has 2½ fathoms on it, deep water around, and is marked on its eastern edge by a white beacon buoy with iron cage, surmounted by a ball, with the summit of the middle islet of the Tre Sorelle bearing W. by S.

**ESO ISLAND** lies in the middle of the northern part of the Mezzo channel; it is 6½ miles in length, about a mile in breadth, and its greatest height, nearly one-third from the northern end, is 558 feet.\* \*Lat. 44° 3' N.  
Long. 15° 6' E.  
Nearly the whole of the north-eastern portion is cultivated; the opposite side is covered with bushes. There are about 350 inhabitants, who manufacture earthenware for exportation.

Its north-eastern side is irregular, with several coves, in one of which is the village of Esoponentale. Four islets lie eastward of Eso.

**Beacon.**—At about 2½ cables north-north-westward of Knezak, one of these islets nearly joined to Eso, and about 3½ cables from the shore, is a sunken rock marked by a beacon 11 feet high, painted white.

**Directions.**—Vessels entering the Mezzo channel, after passing the southern end of Sestrunj, should keep on the Uglian island side so as to avoid the dangers off the north-western end of Eso.

**Telegraph cables.**—Eso island is connected by telegraph cable with Grossa; also with Uglian, and thence with Zara on the mainland.

Chart, 2,774 [801].  
 Lat. 44° 3' N.  
 Long. 15° 7' E.  
 Var. 8° 10' W.

**LIGHTS.—Eso Grande.**—On the south shore of the entrance to Eso Grande, a *fixed green* light is exhibited, elevated 18 feet above the sea, and visible in clear weather from a distance of 2 miles.

**Arta point.**—On Arta point, at the eastern side of the southern end of Eso island, a *fixed red* light, elevated 19 feet above the sea, is exhibited, visible in clear weather from a distance of 4 miles.

**Belo.**—This little islet, 145 feet high, lies off the north-western end of Eso; southward of it are three smaller islets, and a sunken rock about 1½ cables from the shore of Eso. About 5½ cables N.N.E. of Belo islet is a shoal with 3 feet water; and, three-quarters of a mile N.W. by N. is another with one fathom water.

Vessels at times take shelter between Belo and Eso in about 11 fathoms, sandy bottom; but, midway, there is a shoal with 3½ fathoms.

**UGLIAN ISLAND.**—The south-eastern end of this island almost joins the north-western end of Pasman island. It is 11½ miles in length north-west and south-east, with an extreme breadth of 2 miles. Its hills are of moderate height, the most remarkable and highest being mount Grande,\* 945 feet above the sea, in the middle of the island, and another hill a mile south-eastward of it, on which stands, very conspicuously, the old castle of St. Michiele.

There are about 7,000 inhabitants who principally reside on the north-eastern side. Wine and oil are the products, and fishing the chief occupation. Like most of the Illyrian islands, Uglian affords but little fresh water.

The south-western coast rises abruptly, is steep-to, covered with wood, and uninhabited. At its southern end, the coast falls back and forms two or three bays fronted by three islets and some patches with 2½ and 3½ fathoms water. Lamjane, one of these bays, is resorted to by small craft. This side of the island, and that of Pasman, forms the north-eastern side of the Mezzo channel.

The north-eastern coast of Uglian slopes gradually to the sea, is irregular, with several coves of bold approach, and forms the south-western side of the Zara channel, the distance between its nearest part and the town of Zara being about 2 miles.

**Port Kale.**—The only anchorage is port Kale, between Calogera or Lazaretto islet and the shore of Uglian; the islet is 295 feet high, overgrown with bushes, and on its north-western side are a house, some mills, and a patch of cultivated ground.

The village of Kale is at the head of the bay southward of Calogera islet.

**LIGHTS.—San Pietro point.**—At about 4 cables south-west of the north-west extreme of Uglian island, a *fixed green* light, elevated 16 feet above the sea, is exhibited, visible in clear weather from a distance of 2 miles; when bearing from N. 9° E., through east, to S. 9° W.; and a fainter gleam from S. 9° W. to S. 15° W., also from N. 2° E. to N. 9° E.

**Port San Euphemia.**—On San Gregorio point, eastern side of entrance to port San Euphemia, a *fixed* light, elevated 21 feet above high water, is exhibited, visible from a distance of 3 miles, showing *red* when bearing from N. 48° W., through west and south, to N. 12° E.; *white* elsewhere.

**Oltre.**—At Oltre, on the east coast of Uglian, W. by N. of the north end of Calogera island, a small *fixed green* light is shown on the pier from an iron pole 13 feet above the sea, and is visible 1½ miles.

**Karantunic.**—On the summit of Karantunic rock, off the south end of Uglian island, and on the northern side of the western entrance to

\*Lat. 44° 5' N.  
 Long. 15° 9' E.

Lat. 44° 6' N.  
 Long. 15° 10' E.

Zdrelac strait, a *fixed white* light (unwatched) is exhibited from a small white iron tower, at an elevation of 104 feet above the sea, visible in clear weather from a distance of 7 miles. Char. 2,774 [801].  
Var. 8° 10' W.

**Telegraph cables.**—A telegraph cable connects Oltre, on the east coast of Ugljan with Zara on the mainland abreast; cables also connect Ugljan with Eso and thence to Grossa island.

**Zdrelac strait**, the channel between Ugljan and Pasman islands has a depth of  $9\frac{3}{4}$  feet over a length of about 2 cables, with a breadth of 26 feet at the bottom, and 39 feet at sea level. Lat. 44° 1' N.  
Long. 15° 15' E.

The northern end of the channel is marked by two groups of stakes surmounted by boards painted red and white; the southern end by two iron poles fixed in the rocks carrying similar boards. On Ugljan, northward of the cutting, two poles, surmounted by boards, kept in line, lead through the axis of the channel.

**Port Zdrelac** is a small basin at the eastern end of Zdrelac strait, and has a depth of little more than 2 fathoms, mud; from the Zara channel the two islands appear to be nearly united at the head of the harbour.

**PASMAN ISLAND.**—This island is  $11\frac{1}{2}$  miles in length, in a north-west and south-east direction, nearly the same as Ugljan, and its breadth near the middle  $2\frac{1}{2}$  miles. It reaches 900 feet in height about one-fourth its length from the north-western end, and is rather more hilly than Ugljan, of which it would be the continuation but for the break caused by Zdrelac strait. It contains about 3,500 inhabitants, of whom the greater part reside in villages on the north-eastern side; their occupations and the produce of the soil are similar to those of Ugljan.

**Telegraph.**—There are telegraph stations at Pasman town, Zdrelac, and Tkon.

From Tkon a submarine cable is laid to Zara Vecchia on the mainland; see page 180.

**Port Krusevica and Soline cove**—both on the south-western side of Pasman, the former northward of Kosara island and 3 miles from the south-eastern extreme of Pasman; the latter, 2 miles farther north-westward—are frequented by small craft which make fast a cable to the shore; in both, the depth is about 12 fathoms. Bora squalls are severely felt in them.

**LIGHT.**—**Kosara.**—On the western extremity of Kosara island, lying in the Mezzo channel off the southern end of Pasman, a *fixed white* light (unwatched) is exhibited from an iron tower, at an elevation of 39 feet above high water, and is visible in clear weather from a distance of 8 miles. Lat. 43° 53' N.  
Long. 15° 24' E.

**Triluke cove**, at the south-eastern extreme of Pasman, is convenient for small vessels prevented by the current or contrary winds from proceeding through Pasman strait; it has depths of from 10 to 15 fathoms, muddy bottom, and is well protected from either the Bora or westerly winds by the land and Lizanj island, and from southerly winds by Gangaro and the Kotola islets. A rocky shoal with about 3 feet water lies near the eastern point of Lizanj island; and, farther out, at nearly half a mile and two-thirds of a mile respectively from the south-eastern side of the island, are two rocks above water, with 5 fathoms between them and the shoal.

**Shoal.**—A shoal with 2 fathoms water lies one cable N.E. by N. from the north-western Kotola islet, and there is apparently, by the chart, a shoal the same distance north-west of that islet. At 3 cables southward of the easternmost Kotola islet is another rocky shoal of  $4\frac{1}{4}$  fathoms. From Borovnjak point, the southern extreme of Pasman, a rocky bank with 2 fathoms water extends  $1\frac{1}{2}$  cables south-eastward; the channel

Chart, 2,774 [801].  
Var 8° 10' W.

between this bank and Kamicic island is 6 cables wide and that leading to the anchorage is on either side of Kamicic islet, avoiding the shoal off Borovnjak point, and passing northward and eastward of the Kotola and Lisanj islets and of their outlying shoals just described.

**ZARA CHANNEL.**—The depth in this channel between Uglian and Pasman islands on the one side, and the coast of Dalmatia on the other, varies from 27 fathoms at the entrance, to 8 fathoms, mud and sand, near Pasman strait, its continuation southward. There are no hidden dangers if we except the Saida shoal, already described, and a 4-fathoms rocky shoal  $3\frac{1}{2}$  miles north-eastward of it, on the opposite side of the channel, and about W.  $\frac{1}{2}$  N.  $2\frac{3}{4}$  miles from the village of Zaton on the mainland.

\*Lat. 44° 16' N.  
Long. 15° 6' E.

The coast of the mainland from Artic point,\* about a mile south-westward of Brevilacqua strait, to 4 miles south-eastward of Zara, is backed by low hills and well cultivated ground; from thence southward, as far as the neighbourhood of the town of Zara Vecchia, the land is higher and of desolate aspect.

Lat. 44° 11' N.  
Long. 15° 9' E.

**Petrčani.**—Half way between Artic point and Zara, and about one mile south-eastward of Skala point, is the village of Petrčani, at the head of port Schiavina; there is a mooring buoy in the road.

**Light.**—At Radman point, on the southern side of port Schiavina, a *fixed* light is shown from an iron column at an elevation of 19 feet above the sea, visible 3 miles, and showing *red* when bearing from S. 31° E., through east and north, to West; *white* elsewhere.

**Anchorage.**—Diklo anchorage, about 8 miles from Artic point and nearly 3 miles south-eastward of Petrčani, has a depth of 10 or 11 fathoms, mud, a little southward of the town of Diklo and from 3 to 5 cables off-shore.

Plan of port Zara  
on chart,  
2,774 [801].  
Lat. 44° 7' N.  
Long. 15° 13' E.

**PORT ZARA** is a secure little harbour, rather more than one cable wide, abreast the central part of Uglian island and 2 miles south-eastward of Diklo; the harbour is inside a point which extends north-westward nearly three-quarters of a mile parallel with the coast; on this point the town of Zara is built.

**A mole** upwards of a cable in length projects from the eastern shore opposite the northern point of the town, which in part covers the mouth of the port and narrows the entrance to less than half a cable. The depths are from 8 to 10 fathoms near the entrance, from whence they decrease regularly to 2 fathoms at the head of the port; the bottom on the north-eastern side is rocky. Vessels in the inner part of the harbour moor with a cable to each shore.

**Buoys and beacons.**—On the shoal extending from Maestro point, east side of approach, is a white stone beacon 8 feet high, erected in 6 feet water, 76 yards from the shore, and there is no passage inside it. A white mooring buoy, belonging to the Austrian Lloyd's Company, lies in 8 fathoms in the widest part of the harbour, opposite Bora cove; small vessels of war are permitted for temporary purposes to make fast to the buoy, but if a vessel is of much length it is necessary to haul the stern in towards Cereria point, the southern point of Bora cove, as there is not room to swing.

There is space in the port for one or two small vessels to moor head and stern, but the above buoy is in the best berth. There are two other mooring buoys further up the harbour; also two warning buoys. A buoy lies in 16 feet water, 80 yards westward of Cereria point, marking the edge of the shoal water.

**The town of Zara**, ancient *Jadera*, is the residence of the Governor of Dalmatia and is cut off from the mainland by a fosse; it was formerly entirely surrounded by fortifications, but the walls and bastions on the sea front have been levelled, giving place to buildings, a promenade and an ordinary sea wall 3 or 4 feet above the level of high water, springs, with steps here and there for convenience in landing. It contains about 12,200 inhabitants, who carry on considerable commerce in wine, maraschino, made from the mascara or wild cherry, oil, and grain.

Plan of port Zara  
on chart, 2,774  
[801].  
Var. 8° 10' W.

An arsenal, storehouses, hospitals, barracks, the ruins of an aqueduct, an opera house, and a fine cathedral attest its former importance; the marine gate is part of an ancient funeral arch. The neighbouring town of Nona has furnished it with many relics of antiquity.

**Coal and supplies.**—About 6,000 tons of coal are usually in stock, of which about 1,500 is for the use of the Austrian Navy. Water may be procured from a spring half a mile southward of the town, near an old lazaretto close to the shore; rain water only can be obtained in the town. Provisions are plentiful.

**Telegraph.**—There is telegraphic communication between Zara and Uglian island, thence to Eso and Grossa, the cable leaving Zara near the hospital used for contagious diseases, and being landed near Oltre, southward of San Paolo islet. Shore beacons mark the landing places of the cables, and also of a telephone cable across the entrance of port Zara, from the Health office to the end of the breakwater. Anchorage and bottom-fishing is prohibited in the vicinity of these cables.

**LIGHTS.**—At **Mika point**, a mile northward of the town of Zara, a *fixed white* light, is exhibited from a green iron column at an elevation of 39 feet above the sea, visible in clear weather from a distance of 11 miles. Lat. 44° 8' N.  
Long. 15° 12' E.

**Fog signal.**—When the signal of a passing vessel is heard at Mika point during a fog, a bell is sounded for *one minute*; silent *two minutes*; then sounded again for *one minute*; and so on.

**Harbour lights.**—At the extreme of the mole at Zara, on the port hand in entering, and also from the corner of the city wall on the starboard hand, *fixed red* lights, visible 2 miles, are exhibited. *Two red* lights vertical are shown when vessels cannot enter as below mentioned.

A *fixed green* electric light, elevated 19 feet above the sea, visible 3 miles, is exhibited from Franz Joseph mole. Lat. 44° 7' N.  
Long. 15° 13' E.

**Harbour regulations.**—(1) All vessels are prohibited from entering the harbour when one of the following signals is shown from a small, brown, wooden house, situated at the north-western angle of the sea wall of port Zara:—

- a. By day: A red cone, hoisted on a staff above the house.
- b. By night: Two *red* lights placed vertically, at the western angle of the house.

The above signals indicate that a vessel is leaving the harbour, and are shown until she is at least a cable outside the entrance.

(2.) While one of the above signals is shown, vessels from seaward must wait, at least 1½ cables outside the entrance, allowing a clear passage for the vessel leaving, until the signals are discontinued.

(3.) When two vessels are approaching the entrance of the harbour at the same time, they must not attempt to enter together, but the one astern or to the northward is to wait until the leading vessel has passed the entrance.

Plan of port Zara  
on chart, 2,774  
[801].  
Var. 8° 10' W.

(4.) Vessels ready to leave should hoist, by day, Flag P of the International Code, and by night a *red* light above a *white* light. Before leaving the harbour, masters of vessels must apply to the Harbour pilot (Quay inspector) to order the necessary signal to be shown; and the vessel must not leave the harbour until the signal is made.

(5.) All sailing vessels entering or leaving the harbour are to be towed or warped out unless the wind is fair. Those entering must at once proceed to the north-east side of the harbour, and those leaving must stand to the westward directly they are clear of the entrance.

(6.) Of the above regulations, only Article 5 applies to barges of all descriptions, and specially exempted local steamers.

(7.) Steam vessels approaching Zara harbour must sound their steam whistles, those from the north-westward must reduce their speed when a cable from the entrance; and those from the southward on rounding the western angle of the sea wall.

Steam vessels leaving the harbour must sound their bells.

**Anchorage.**—Vessels too large to enter the port, anchor about one-third of a mile westward of the town, in depths of 15 to 20 fathoms, mud, or farther out if necessary. Off the western side of the town is a mooring buoy for the Austrian Lloyd's steamers.

**Prohibited anchorage.**—Vessels are prohibited from anchoring in the roadstead at port Zara, with Mika point lighthouse bearing between N. 30° W. and N. 45° W.

**Salvage.**—There is a vessel of 43 tons at Zara, available for salvage purposes.

Chart, 2,774 [801].

**THE COAST.**—**Temporary anchorages.**—There are none but indifferent anchorages on the Dalmatian coast between Zara and Pasman strait, 10 miles to the south-eastward. Small vessels, however, bring up between Zara and Bibinje in a depth of 9 or 10 fathoms, muddy bottom, about 2 cables from the shore; also in 5½ fathoms at port St. Cassano, on entering which it is necessary to drop the anchor near the middle, from whence the soundings decrease rapidly, becoming rocky near the shore. Vessels also anchor northward of Galesniak island, at the entrance to Pasman strait, in 5½ fathoms, a short half mile from the shore.

Lat. 44° 3' N.  
Long. 15° 18' E.

**LIGHT.**—A *fixed red* light (unwatched), at an elevation of 20 feet above the sea, is exhibited at port St. Cassano from an iron frame 23 feet high, in 2 fathoms water, 150 yards off shore near Podvara point, visible in clear weather from a distance of 6 miles, when bearing from S. 28° W., through south and east, to N. 37° W.

Plan of Pasman  
strait on chart,  
2,774 [801].  
Lat. 44° 0' N.  
Long. 15° 21' E.

**PASMAN STRAIT.**—The navigation of this strait, which is a continuation of the Zara channel, is rendered difficult by the numerous islets, rocks, shoals, and currents in the vicinity of the town of Pasman, at the narrowest part of the channel. The country on both sides of the strait is well cultivated and produces oil and muscatel wine.

Babac island, 105 feet high, is the largest and principal islet of the group lying in the middle of the strait and dividing it into two channels.

**The western passage,** between Babac and the town of Pasman, is the deeper, carrying 4½ fathoms in the best water, and, though narrow, is the most frequented. A bank with 2½ fathoms occupies the centre of the channel and extends about 2 cables southward of the light on Babac. Another shoal patch of 3 fathoms lies 2½ cables northward of the light. The channel lies westward of both.

**LIGHTS.—Babac island.**—On the west point of Babac island, from an iron stand 50 yards from the keeper's dwelling, is exhibited at an elevation of 22 feet above the sea, a *fixed white* light, visible in clear weather from a distance of 10 miles when bearing from about S. 31° W., through south and east, to N. 42° W.

Plan of Pasman strait on chart, 2,774 [801].  
Lat. 43° 57' N.  
Long. 15° 24' E.  
Var. 8° W.

**Pasman.**—A *fixed red* light is exhibited on the mole at Pasman, at an elevation of 17 feet above the sea, visible 5 miles; it shows towards the channel from the bearing S. 30° E., through south and west, to N. 36° W.

**Cavata islet or rock.**—About 1½ miles south-eastward of Pasman town, on the eastern side of Cavata islet or rock, from an iron framework on masonry base, in a depth of 1¼ fathoms, a *fixed green* light (unwatched) is exhibited, elevated 28 feet above the sea, and visible at the distance of 3 miles.

**Sta. Caterina islet.**—On the south-west extreme of Sta. Caterina islet, 1½ miles south-east of Babac island stands the keeper's dwelling, from which at an elevation of 38 feet above the sea, is exhibited a *fixed red* light, visible in clear weather from a distance of 8 miles, when bearing from S. 20° E., through east and north, to N. 43° W. The latter bearing leads one cable westward of the Ostaria rock which lies 2 miles south-eastward of Zara Vecchia.

**Zara Vecchia.**—A *fixed green* light is exhibited, at an elevation of 18 feet above the sea, on the north-west mole head at Zara Vecchia, visible 2 miles. Obscured between the bearings of S. 24° E. and S. 35° E. (11°).

Lat. 43° 56' N.  
Long. 15° 28' E.

**Directions.**—The western channel is the deeper of the two, but the most intricate; the eastern one is easier for vessels under 18 feet draught.

Vessels from the northward in closing with Babac island for the western channel, should keep about 2 cables from the northern part of the town of Pasman, so as to avoid the shore bank on the Pasman side. The eastern side of Cavata islet, 39 feet high, just open of the western point of Babac island, S. 30° E., leads westward of the shoals north of Babac; when the south extreme of Komornik bears East, edge cautiously to the southward midway between the town and western extreme of Babac (on which is a chapel and the light establishment), with the east extreme of Monton island, S. 18° E.; pass the north extreme of Monton at rather less than a cable to clear the shoal lying in mid-channel. Calogera islet over Brizine point astern leads southward of the mid-channel shoal. See view B on plan. Pass northward of Cavata islet, and south-westward of Planac and Sta. Caterina islets.

As the marks for the western passage in the narrowest part, where the course has to be altered are somewhat indistinct, and as the strength of the current may cause alteration in the shoals, great caution is required in vessels other than those of light draught.

From the northward, by the eastern passage, or that between Babac island and the coast of Dalmatia, round the northern side of Komornik islet at the distance of 1½ cables and keep along by Babac at that distance with Prucanik point on with the south-western fall of Artá island (see view A on plan), leaving the Kocensko shoal, marked by a white stone beacon 13 feet high, on the port hand; pass Zara Vecchia about 1½ cables off, and leave the islets westward of it on the starboard hand, and from thence into the middle of the channel.

The bottom is almost everywhere sand and shells, and the water being very clear the depth often appears less than it is. Both ebb and flood streams are very perceptible in the channel, and attains at times a rate of

Plan of Pasman  
strait on chart,  
2,774 [801].  
Var. 8° 10' W.

2 miles an hour or more. When the current is opposed by a strong wind an increase of depth takes place, especially at its narrowest parts.

About 2 miles south-eastward of Zara Vecchia and  $1\frac{1}{2}$  cables from the shore is Ostaria rock, before mentioned, off which is shoal water for some little distance.

When proceeding to Pasman strait from the southward, the passage between the north-western end of Morter island and Great Arta on the starboard hand, and Vergada and off-lying islets and shoals on the port hand, may be used. In taking this passage, the Moll rock, 4 feet high and half a mile from the shore of Morter island, as well as the smaller islets and dangers should be carefully avoided, the chart and eye being the guides. Or, the passage\* leaving Vergada with its off-lying islets and Kozina on the starboard hand, and Obonj and the Kotola islets on the port hand, may be taken, passing on either side of the little islet of Kamicic.

\*Lat. 43° 51' N.  
Long. 15° 28' E.

The coast of the mainland between Zara Vecchia and Tunjara cove should not be approached too closely; a depth of  $5\frac{1}{2}$  fathoms will be found a little more than  $1\frac{1}{2}$  cables from it and at this distance coasters may anchor if detained by weather.

**Anchorage.**—A mooring buoy for small steamers lies off Torette out of the fairway. Vessels anchor from 4 to 6 cables north-westward of Zara Vecchia in about  $3\frac{1}{2}$  fathoms, and off St. Filippo e Giacomo in  $4\frac{1}{2}$  fathoms, or in the middle of the strait, southward of Sta. Caterina islet in about 8 fathoms. Cistern water in small quantities is obtainable at Zara Vecchia but no other supply, and, although it is the chief town or village in Pasman strait, with 1,050 inhabitants, it is entirely unimportant.

**Telegraph stations.**—There are telegraph stations at St. Filippo e Giacomo and Zara Vecchia.

A submarine cable is laid from the southern side of Zara Vecchia to the south-eastern side of Tkon in Pasman island. Anchorage and bottom fishing is prohibited in the vicinity of this cable.

Chart, 2,774 [801.]

**Vergada island**, situated  $2\frac{1}{4}$  miles south-eastward of Pasman island, is  $1\frac{1}{2}$  miles in length, and consists of arid hillocks of nearly equal height; its highest part is 377 feet above the sea, and there is a village on its north-eastern side. There is no good anchorage, and several islets and shoal patches lie around it.

Lat. 43° 53' N.  
Long. 15° 31' E.

**COAST.**—**Tunjara cove**, in the mainland on the northern side of the point of this name is open to the westward but is partially sheltered by the off-lying islets; the depth in the middle is  $5\frac{1}{2}$  fathoms, sand. A hill overlooks and marks this anchorage; a vessel in proceeding to it should pass between Zavinac islets and the southern point of the bay; the passage eastward of the islets is not so good.

Lake Vrana lies at the back of this part of the coast and parallel with it for a distance of  $7\frac{1}{2}$  miles; the exhalations from it cause this vicinity to be unhealthy.

Lat. 43° 50' N.  
Long. 15° 37' E.

**Zlosela bay** is a deep inlet in the main coast extending about 5 miles south-eastward from abreast of the north-western end of Morter island and is fronted by the northern part of that island, which, with several smaller islands, islets, and shallow water, forms a complete and unbroken chain of shoals entirely blocking the approach to the bay to all but very small vessels with local knowledge.

Water and provisions may be procured at the town of Zlosela; fish are plentiful in the bay.

**Light.**—A *fixed red* lantern light elevated 15 feet above the sea, and visible at the distance of 4 miles, is exhibited at the south end of the quay at port Zlosela. Chart, 2,774 [801].  
Var. 8° W.

**Telegraph.**—Zlosela is connected with the telegraphic system of the country.

**MORTER ISLAND**, situated with its north-western end about  $2\frac{1}{2}$  miles south-east of Vergada island, is 6 miles in length with an irregular coast line, its greatest breadth not exceeding  $1\frac{1}{2}$  miles; the land rises near the centre to 408 feet, and is connected with the mainland by a swing bridge. It is exceedingly well cultivated, and has 2,500 inhabitants, who reside on the northern and eastern sides, and whose chief occupation is the culture of the vine, fig, and olive. It appears to have been an ancient cemetery. The view from the island is very beautiful.

The south-western coast is uninhabited and has deep water close to it, affording no places of shelter even for the smallest vessels, except Kosirina cove, and the little inlet of St. Nicolo\*; in this latter, vessels bring up when not intending to enter the channel at night. The high point at the left of the entrance is sugar-loaf shaped and marks this anchorage.

\*Lat. 43° 46' N.  
Long. 15° 38' E.

**LIGHTS.**—**Prisnjak islet.**—Near the western extreme of Prisnjak islet, the north-west end of Morter island, stands the keeper's dwelling, from which at an elevation of 32 feet above the sea, a *fixed white* light is exhibited, visible in clear weather from a distance of 9 miles, when bearing from S. 26° E., through east and north, to N. 58° W.

**Betina.**—A *fixed red* light, at an elevation of 19 feet above the sea, is exhibited from the landing place of Betina, near the north-east end of Morter island, visible in clear weather from a distance of 2 miles.

Lat. 43° 49' N.  
Long. 15° 36' E.

**Hramina.**—At Hramina, on the northern coast of Morter island, about half a mile westward of Betina, a *fixed* light, elevated 19 feet above the sea, is exhibited, showing *green* seaward, *white* towards the land, visible 2 miles.

**MORTER BAY** lies between the south end of Morter island and the mainland; it is about 3 miles in length by one mile in breadth. It is fully sheltered from all but south-east winds, and the several islands in it partly protect it from that direction.

Plan of Morter  
bay on chart  
1,581 [802].

**The Kuljar (Kukuljar) islets** are four small islets, of which the largest, 55 feet high, bears S.W. by S. about 7 cables from the entrance to St. Nicolo inlet, and they lie on the north side of approach to Morter bay from the westward. They are steep to except on the western side of the largest islet, off which is a rocky shoal; the westernmost island is just outside the largest islet and is itself scarcely more than a reef, of which the highest rock is only about 2 feet above the sea.

Chart, 2,774 [801].

**LIGHT.**—In the centre of the easternmost Kuljar islet stands a white iron tower, 25 feet high, from which, at an elevation of 38 feet above the sea, is exhibited a *fixed red* light (unwatched), visible in clear weather from a distance of 5 miles.

Plan on 1,581  
[802].

**Berghofer shoal**, with  $2\frac{1}{2}$  fathoms water, lies  $1\frac{1}{2}$  miles E.S.E. from the largest of the Kuljar islets, half a mile from the shore of Morter island, with the southern end of Drazamaski islet on with Trebocconi church bearing about E.  $\frac{3}{4}$  S.

**Botticella rock**, a small half tide rock shaped like a boat and marked by a stone beacon, lies S. by E. about one mile from Obinus point

Lat. 43° 45' N.  
Long. 15° 42' E.

Plan of Morter  
bay on chart,  
[581 [802].  
Var. 8° W.

on the main coast, on the east side of Morter bay. The vicinity of this and the last mentioned danger should be avoided, especially at night.

**Anchorage.**—Vessels anchor in Morter bay between Morter island and the mainland, in a depth of  $11\frac{1}{2}$  fathoms, near Stretto town; and also in the small bay abreast of the town. The channel north-westward of the bridge is used by vessels of very light draught.

**Lights.**—A small *fixed red* light is shown from a lamp-post on the buttress of the swing-bridge at Stretto, 13 feet above the sea, and visible 2 miles. An additional *red* light is shown when the bridge is open.

A *fixed red* light is also shown at Stretto molehead, elevated 21 feet above the sea, and visible 2 miles.

**Directions.**—In approaching Morter bay, where there are several islets, the clock-tower of Jezerà is visible at a considerable distance. Nearly equi-distant between the three islets at the head of the bay, is a shoal with  $2\frac{1}{2}$  fathoms water; elsewhere, the shores of the bay and islets are clean and free from dangers. Berghofer shoal in the approach should be given a berth by passing round Rat point if from the westward, or approaching with Drazamaski islands on about a N.N.E. bearing if from the southward, and passing fairly close to them.

Chart, 2,774 [801].

**ZURI ISLAND**, is the westernmost of the group of large islands south of Morter island; it is  $6\frac{1}{2}$  miles in length in a north-west and south-east direction, and its extreme breadth is  $1\frac{1}{4}$  miles, tapering at either end, with irregular indented shores; the island consists of two parallel lines of hills united by a plain; the highest part is 430 feet above the sea.\* At a distance, the plain not being visible, the island appears as two; the plain is well cultivated and the island is well known for its numerous Roman ruins; an extensive coral fishery was formerly carried on in its neighbourhood by Neapolitan fishermen. Several islands between it and the mainland have marble quarries.

Lat.  $43^{\circ} 39' N$ .  
Long.  $15^{\circ} 40' E$ .

On approaching from the southward, the coast south-eastward appears covered with trees and bushes; north-westward, it is generally rocky and of whitish aspect. A conspicuous white monument near the north-west extreme of Zuri, forms a good landmark.

This island, with Zlarin and Provicio, presently described, are the most populous and important islands in the Sebenico district; good wine is produced and sardines and other fish are caught in great abundance.

**Zuri village** is on the central plain between the hills about one-third from the north-western end of the island.

**Balkun, Kosmerka and Ravna islets**, situated about 2 miles westward of Zuri island, form a group of five small islets, extending  $1\frac{1}{4}$  miles in a north-west and south-east direction.

A **sunken rock** lies E.S.E. about half a mile from Ravna, the southernmost islet; a sunken rock lies close south-west of Ravna.

At  $1\frac{1}{4}$  miles south-eastward of Ravna islet is a rocky bank with  $6\frac{1}{2}$  fathoms water, and with depths of 10 fathoms around. These islets and dangers are steep-to; Lucietta light, to the westward is a good guide for clearing them.

The Nodre rock, 26 feet high, and Rapanjasnjak islet, 36 feet in height, lie off the north-western end of Zuri, the former half a mile, the latter about two-thirds of a mile from the island. Sedlo islet, 49 feet high, lies  $1\frac{1}{2}$  miles W. by  $\frac{1}{4}$  S. from Nodre rock, and Samograd islet, 118 feet in height, lies nearly  $1\frac{1}{4}$  miles W. by N. from Rapanjasnjak; about midway between Sedlo and Samograd islets are the Botticella rocks, 3 feet high.

Lucietta lighthouse on a S.  $\frac{3}{4}$  W. bearing leads westward of both Nodre rock and Rapanjasnak islet, and eastward of the other islets mentioned, and of a small 5-fathoms patch, one-third of a mile south-east of Sedlo islet.

**Saracino cove**, on the western side of Zuri, is about  $1\frac{3}{4}$  miles from the north-western extreme of the island, and, though small, is well sheltered from all but southerly winds; the anchorage is in 12 fathoms in the middle of the cove.

**Stupica bay**, at  $1\frac{1}{2}$  miles westward of the south-eastern extreme of Zuri, is well protected from northerly and westerly, but exposed to south-easterly winds. The anchorage is at the entrance in 9 to 11 fathoms; farther in, the depth is 7 fathoms and the bottom rocky. The widest channel to Stupica bay is between Skervada and Bavkul islets; the former is connected with the shore by shallow water. A shoal lies more than  $1\frac{1}{2}$  cables off the eastern side of entrance.

Masirina islet, close to the south-eastern end of Zuri, is 188 feet high and clear of danger, but a rock above water lies off the south extreme of Zuri.

**Port Zuri**.—The north-eastern coast, south-eastward of port Zuri, is quite exposed to the Bora, from which it affords no shelter. Small vessels anchor off the village of Zuri in from 14 to 17 fathoms, sand and weed, and secure to the shore; the port is open to the north-west, but there is a mole, inside of which boats take refuge. The port may be recognised by some large store-houses on the sea side.

**Telegraph**.—There is a post and telegraph office at port Zuri.

**ZURI CHANNEL** lies between Zuri and the islands eastward of it, *see* the following islets and dangers; for its navigation, the chart is the best guide.

**Prastici rock**, on which is a depth of 9 feet, is marked by a white beacon surmounted by a ball, and lies nearly a mile north-westward from the entrance of port Zuri. A rocky shoal with  $3\frac{1}{2}$  fathoms, lies about a third of a mile northward of the north-western extreme of Zuri island; another shoal, with Mikavica rock on it 13 feet high and farther south-eastward, lies  $1\frac{1}{4}$  miles W.N.W. from the Prastici rock.

**LIGHT**.—**Hrbosnjak**.—On Hrbosnjak islet, situated in the south-eastern entrance to Zuri channel, a *fixed white* light (unwatched) is exhibited from a small iron tower, painted white, at an elevation of 81 feet above the sea, visible in clear weather from a distance of 7 miles.

**Kakan island**, on the eastern side of Zuri channel, consists of barren hillocks with intervals covered with bushes, and is 367 feet high at its south-east end. Kakan rock 6 feet high, is  $3\frac{1}{4}$  cables from the north-western point of the island, and there is a depth of about 10 fathoms between it and the shore.

The south-western coast affords no shelter whatever; a shoal with  $2\frac{1}{2}$  fathoms lies near its south-western end and another shoal with two islets, off its south-eastern extreme.

In a small bay in the middle of the north-eastern coast of Kakan island, is an anchorage for small vessels in a depth of about 9 fathoms, well protected by islets on the north, and by Kapri island from easterly or southerly winds.

**Tatevisnjak\* and Cavlin islets**.—These are the principal islets of a group of islets, shoals, and banks, extending 3 miles in a north-westerly direction from Kakan island. Tatevisnjak, the largest of the

Chart, 2,774 [801].  
Var. 8° W.

Lat. 43° 38' N.  
Long. 15° 41' E.

Lat. 43° 40' N.  
Long. 15° 39' E.

Lat. 43° 39' N.  
Long. 15° 44' E.

\*Lat. 43° 43' N.  
Long. 15° 35' E.

Chart, 2,774 [801].  
Var. 8° W.

group, is circular, one-third of a mile in diameter, and 243 feet high; Cavlin, the next in size and the north-western islet, is 118 feet high. The smaller islets, rocks, and shallows, are scattered between them and Kakan, as well as both northward and westward of Cavlin, with deep water between and amongst them; one dangerous spot covered with 6 feet water lies N.W. by W.  $\frac{5}{8}$  W. one mile from Cavlin islet.

The summit of Tatevisnjak bearing eastward of S.E. by E.  $\frac{1}{2}$  E. leads southward of these dangers; and Mertovnjak islet bearing southward of S. by W. leads westwards of them.

**Kapri island**, like Kakan, consists of barren hills, of which the highest is 433 feet above the sea and is near the southern end of the island, which is about  $3\frac{1}{2}$  miles in length with an irregular coast line and nearly united to Kakan. The narrow channel between them is from 7 to 11 fathoms deep, but is seldom used even by the native coasters, as the current through it is rapid.

Lat. 43° 41' N.  
Long. 15° 42' E.

Port Kapri, an inlet on the south-western side, is the only anchorage; the depth is about 8 fathoms at the entrance, from whence to the head the decrease is gradual. It is well sheltered, being open only to the north-west, and affords refuge to small vessels; near it is a small village.

Plan of Sebenico  
approaches,  
1,581 [802].

**SEBENICO APPROACHES.—Zmajan island**, the next large island eastward of Kapri, and in the western approach to Sebenico, when seen from the southward, has the appearance of a long hill, of which the highest part is 475 feet in height, and is towards the north-west. It is rather more than 2 miles in length, and its sides, which are steep-to, afford no shelter, except in Smetna bay, a small inlet near the southern end. Between it and Kapri is a narrow channel rendered intricate by islets and shoals, among which the current sets with considerable velocity.

Six islets form a continuous chain for about  $3\frac{1}{2}$  miles south-eastward of Zmajan; parallel with Zlarin island, with which they form the channel of that name. All these islets are of safe approach except Komorica, the most south-eastern, 75 feet high, close to the southern end of which is a rock awash.

Lat. 43° 39' N.  
Long. 15° 50' E.

Between Komorica and Duga islet, nearly a mile westward of it, is a shoal with  $3\frac{1}{2}$  fathoms water.

**Bice (Tiat) island**, nearly a mile north-eastward of Zmajan, consists of several conical hills covered with wood, the highest, 397 feet above the sea, being towards the northern end. It is  $1\frac{1}{2}$  miles in length, and the shores are of bold approach; port Tiascica is a deep inlet in its southern end. The channel between Bice and Zmajan islands is deep and clear.

**LIGHT.—On Tiascica point**, the south extreme of Bice or Tiat island, stands a white lighthouse, 25 feet high, from which at an elevation of 39 feet above the sea, is exhibited a *fixed* light (unwatched); showing *white* when bearing from S. 44° E., through east and north, to N. 40° W.; *red* from N. 40° W. to N. 45° W., over Sestre bank; *white* from N. 45° W. to N. 61° W.; obscured elsewhere. The *white* light is visible in clear weather from a distance of 7 miles, *red* light at 4 miles.

The wreck of an iron steamer lies about a cable eastward of the lighthouse, visible (September 1905) from some distance.

**Zlarin island**.—This island is  $3\frac{1}{4}$  miles in length, its northern part more than a mile in breadth, and in the middle of the south-western side, it rises to a height of 558 feet; when seen from the north-eastward it appears

to be covered with vines and olive trees; when seen from the opposite quarter it presents a very barren aspect. Between this island and the islets extending south-eastward of Zmajan is the Zlarin channel.

Plan of Sebenico approaches, 1,581 [802].  
Var. 8° W.

**Port Zlarin.**—At the north-western end of the island is a triangular bay, named port Zlarin, which has a depth of from 7 to 10 fathoms, mud, sand, and gravel. Boats find shelter in a cove near the village of Zlarin at the head of the bay. The village church is visible some distance seaward.

Lat. 43° 42' N.  
Long. 15° 50' E.

**Light.**—A *fixed green* light elevated 18 feet above the sea is exhibited from the mole head at port Zlarin, visible from a distance of 3 miles.

**Rozenik rock.**—Eight cables northward of the entrance to port Zlarin is Lupac island, 206 feet high; and, from the northern part of Zlarin, rocky patches of from 3 to 9 feet water extend half way across to that island; the shoalest patch and the farthest from the shore is the Rozenik rock. The middle passage to port Sebenico, presently described, lies between this rock and Lupac island.

**LIGHT.**—On Rozenik (Rosenjik) rock, from an iron framework structure on masonry base at the western end of a small mole, a *fixed white* light (unwatched) is exhibited at an elevation of 25 feet above the sea visible in clear weather from a distance of 7 miles.

Lat. 43° 43' N.  
Long. 15° 49' E.

**Telegraph cable.**—Zlarin island is in telegraphic communication with Sebenico; the cable is laid between Veles cove, Zlarin island, and a point 4 cables north-westward of Garmina point; it is laid with a curve to the south-eastward, the points at which the shore ends are landed being marked by stone cairns.

**ZLARIN CHANNEL**,  $1\frac{1}{2}$  miles wide, with depths of from 30 to 35 fathoms, is formed by Bice and Zlarin islands on the north-eastern side, and by Zmajan island and islets south-eastward of it on the south-western side; it is the best channel and that most frequented by vessels bound to Zara, or to ports to the northward, from the neighbourhood of Planka point.

Chart, 2,774 [801].

**Sestre bank** with 2 fathoms water, lies in the fairway of Zlarin channel  $1\frac{1}{10}$  miles S. 28° W. from Maria point, north-west extreme of Zlarin island.

Plan, 1,581 [802].  
\*Lat. 43° 41' N.  
Long. 15° 49' E.

**Buoy.**—A white conical buoy, with ball, marks its north-east side.

A *red* sector of light from Tiascica point, visible between the bearings of N. 40° W. and N. 45° W. covers Sestre bank.

**Directions.**—Approaching Zlarin channel from the southward and eastward, Komorica, the south-eastern islet, will be recognised, and the vessel should be steered mid-channel between it and Zlarin, and then between the buoy marking Sestre bank and the Zlarin shore. Should the buoy not be in position, before the southern end of Sorella islet bears W.  $\frac{3}{4}$  S., and is on with the south extremes of Ravna and Misiak islets, close the shore of Zlarin to 3 cables, and preserve that distance from it until Rozenik light-structure is well open of Zlarin bearing N.E.  $\frac{1}{2}$  N., then haul to the westward for the passage between Zmajan and Bice islands.

**PROVICIO ISLAND**, lies eastward of Bice (Tiat) and is  $1\frac{1}{3}$  miles in length; it is generally lower than those in its vicinity and is of more agreeable aspect, being fertile, highly cultivated, and covered with vines and fruit trees. Provicio village is at the south-eastern end, at the head of port Bodok, which affords shelter to small craft only. There are many country houses here belonging to the inhabitants of Sebenico.

Lat. 43° 43' N.  
Long. 15° 48' E.

Plan of Sebenico  
approaches,  
1,581 [802].  
Var. 8° W.

The population is about 1,600, many of whom are fishermen, and great quantities of salt fish are exported.

The shores are bordered by a narrow bank, except at the south-western part which is steep-to, but southward of Sepurine village on the western side of the island, is a rocky  $3\frac{1}{2}$ -fathoms shoal 2 cables off shore. In taking the channel between this island and the mainland, a mid-channel course should be preserved, as the shore on either side is bordered by shallow water.

The channel between this island and Bice is a safe passage to Vodice road.

**Light.—Sepurine.**—At Sepurine village, on the western side of Provicio island, *two fixed red lights*, vertical, elevated respectively 24 and 19 feet above the sea, are exhibited from a red iron standard, and are visible in clear weather from a distance of 3 miles, between the bearing S. 43° E., through east, to N. 15° W. May not be lighted in bad weather.

**Anchorage.**—Vessels anchor off Sepurine in a depth of about 12 fathoms, sand; there is a fishing-boat cove close to the village.

**Telegraph cable.**—Provicio island is in telegraphic communication with the mainland; the points where the shore ends of the cable are laid are marked by white cairns; vessels anchoring in this vicinity (north end of the island) should be careful to avoid the line of the cable.

**VODICE ROAD.**—This anchorage off the mainland, northward of Provicio island, is one of the best on the Dalmatian coast and is much frequented, especially by vessels awaiting favourable weather to proceed through the narrow channel to port Sebenico.

The anchorage is in a depth of 8 or 9 fathoms, sand, about midway between the village of Vodice and the north-western point of Provicio. Vessels of light draught anchor near the village, eastward of the projecting point westward of it, preserving a distance of at least 2 cables from the shore, near which the bottom is rocky.

There is also anchorage farther westward in 7 fathoms, about 3 cables from the shore of Logorun island; but, between the two anchorages is a rocky  $4\frac{1}{2}$ -fathoms shoal about one-third of a mile from the point southward of San Croce church.

The passage to Vodice road, when approaching from the southward, is between Bice (Tiat) and Provicio islands, *see view on plan, 1,581*; and when from the westward, between Bice and Logorun islands, avoiding the extremes of both islands; or, by the channel between Provicio and the mainland.

**Vodice village** is of considerable size and well built. About a mile from it is the small town of Trebocconi, the birthplace of the celebrated extempore lyric poet Papizza, and where, as at Vodice, grows the cherry which produces the maraschino of Zara and Sebenico.

The shore between Vodice and Trebocconi town, to about  $1\frac{1}{2}$  miles westward, is bordered by a bank with 3 fathoms water at the distance of  $1\frac{1}{2}$  cables from the shore. Trebocconi stands on a rocky projection and is connected by a swing bridge with a point of the mainland 165 feet high; on the latter is the church of San Nicolo, a good mark for this part of the coast.

**Telegraph.**—There is a telegraph station at Vodice.

**Lights.**—From an iron post on the South mole head of Vodice, at an elevation of 20 feet above the sea, is exhibited a *fixed red light* visible

in clear weather from a distance of 2 miles. Obscured from N. 43° W., through west, to S. 84° W., over Vodice shoal and Srma bank. During strong south-easterly gales this light cannot be exhibited.

Plan of Sebenico approaches, 1,581 [802].  
Var. 7° 55' W.

**An iron beacon**, surmounted with a ball, painted white, in 3 fathoms marks the south-eastern edge of Vodice shoal.

**Supplies.**—Here is a spring, and from the abundance of its waters Vodice derives its name; provisions are also procurable and vessels frequently arrive from Sebenico for supplies of both.

**SEBENICO CHANNEL**, with general depths of 8 to 12 fathoms, is the passage formed by Provicio and Zlarin islands on the one side, and by the mainland on the other. The southern entrance, between the south-eastern extreme of Zlarin and the coast, is obstructed by several islets, between which are narrow passages. Of these islets, Duinka is the outermost and is about half a mile south-eastward of the southern point of Zlarin.

Lat. 43° 42' N.  
Long. 15° 52' E.  
Chart, 2,774 [801].

**Srma bank.—Beacon.**—On the north-eastern side of Sebenico channel, about 2½ miles from Vodice, is Srma bank extending 2½ cables from the shore, the outer edge of which, in 3 feet water is marked by an iron beacon, 24 feet high, surmounted by two discs at right angles to each other.

**LIGHT.—Duinka.**—In the southern approach to Sebenico, on the north-west point of Duinka islet stands a lighthouse 27 feet high, from which at an elevation of 26 feet above the sea is exhibited a *fixed red* light visible in clear weather from a distance of 8 miles; when bearing from South, through east, to N. 26° W.

**Krapano**, an island bordering the Dalmatian shore within the southern entrance to the Sebenico channel, is the most remarkable of the islets in this neighbourhood; it is well cultivated and inhabited by about 1,100 persons whose chief occupation is the tunny fishery. Eastward of it is a narrow, tortuous, and shallow passage, with cliffy sides, leading to Andreis town and castle, and to the Morinje lake.

Lat. 43° 40' N.  
Long. 15° 55' E.

Vessels may anchor anywhere in the middle of the channel, in convenient depths and good holding ground, carefully avoiding the vicinity of the telegraph cable which leaves the shore about 4 cables north-westward of Garmina point, *see* page 185; or, if apprehensive of a Bora, close under the mainland.

**Light.**—A *fixed green* light, elevated 18 feet above the sea, is exhibited from an iron post on the mole end of Krapano; visible from a distance of 2 miles, from the bearing of N. 4° E., through west, to S. 42° E.

**PORT SEBENICO** is a narrow basin 5½ miles in length and 2 to 5 cables in width, surrounded by high land and bordered by a rocky shore; the town stands on the eastern shore facing the entrance, 1½ miles from the south-western end of the basin, which terminates in San Pietro bay; the north-western arm, as it narrows a mile beyond the town in the opposite direction, is named Kerka inlet, and is crossed by a telegraph cable at that distance from the town, the shore ends of the cable on each side of the inlet being marked by small towers. The depth of the basin varies from 12 to 20 fathoms, soft mud. The port is entered by San Antonio channel.

Lat. 43° 44' N.  
Long. 15° 53' E.  
Plan, 1,581 [802].

**San Antonio channel**, about 1½ miles in length, is the approach to port Sebenico and lies between rocky cliffs; it is tortuous, varying in

Plan of Sebenico,  
1,581 [802].  
Lat. 43° 44' N.  
Long. 15° 52' E.  
Var. 7° 55' W.

depth from 10 to 24 fathoms and in width from one to 2 cables, the narrowest part being at the inner end. This entrance is defended by St. Nicolo, a fort built on a rock on the southern side of the channel, with a line of embrasures at the edge of the water; the passage in, is between the Kobila rocks (marked by a beacon) and the fort on the south side, and the lighthouse on Jadria point on the north side. Placena shoal extending off the south point of the inner end of the channel, is marked by a square stone beacon.

**LIGHTS.**—Rozenik rock in the western approach.—See page 185.

On Jadria point, the southern end of the islet on the northern side of the western entrance to San Antonio channel, is a lighthouse which exhibits at an elevation of 30 feet above the sea, a *fixed red* light, visible in clear weather from a distance of 4 miles, between the bearings of S. 74° E., through east and north, to S. 42° W.

Fort St. Nicolo. A *fixed green* light, visible, at the distance of 3 miles, between the bearings of N. 55° E., through east and south, and S. 62° W., is exhibited from the wall of fort St. Nicolo, on the southern side of the entrance to San Antonio channel.

On St. Nicolo point, 2½ cables within the fort, a *fixed white* light is exhibited from a wooden post at an elevation of 14 feet above the sea, visible 4 miles.

On Sta. Croce point, north side of inner entrance to the channel, a *fixed green* light is exhibited, elevated 19 feet above the sea, visible one mile.

From an iron standard on the mole head, at the southern end of the town, a *fixed red electric* light is exhibited, elevated 21 feet above the sea, and visible from a distance of 2 miles.

Lat. 43° 45' N.  
Long. 15° 47' E.

**DIRECTIONS.**—Port Sebenico.—There are three passages to San Antonio channel, the Northern, Middle, and Southern:—

The Northern passage, between the mainland and Provicio island, has been already mentioned, page 186. In proceeding either by this or by the Middle passage to Sebenico, between Provicio and Zlarin, care must be taken not to stand in for the entrance of San Antonio channel until St. Nicolo fort bears northward of E.N.E., in order to avoid the shoal extending south-westward from Jadria point. In a vessel of deep draught, in order to avoid the tail of the shoal, it is necessary to steer south-eastward until abreast of the second hill (223 feet high) of Zlarin island, to bring the north extreme of Fort St. Nicolo well open southward of the beacon on the Kobila rocks, before bearing up for the entrance.

The Middle passage, between Provicio and Zlarin islands is less than 4 cables wide, with a least depth of 10 fathoms in mid-channel between Lupac islet on the north, and the Rozenik rock on which there is a lighthouse (see page 185) on the south.

Between the light-structure and the north extreme of Zlarin is a shoal covered with but 9 feet water.

At night, St. Nicolo point light, *white*, in line with Jadria point light, *red*, leads northward of Rozenik rock and light in a depth of 12 fathoms.

The southern passage, between Zlarin on the west, and Duinka (see light, page 187) and Dervenik on the east, is the best and the most frequented; it is very narrow, but opens out after passing Dervenik, and may be taken in a strong south-westerly wind, which is also a fair wind for running through San Antonio channel; and, in bad weather from this quarter, which is here so common, a vessel may anchor in a depth of

10 or 12 fathoms between Zlarin and the mainland, or bear up for the anchorage at Vodice.

Plan of Sebenico,  
1,581 [802].  
Var. 7° 55' W.

The position of Sebenico port and channel may be recognised from the offing by an interruption in the line of islands and islets which almost continuously border the Dalmatian coast; also, by Zuri, the outermost of the group of islands off it, and, on a near approach, by Capočesto village church, which is visible at a considerable distance.

Jadria point lighthouse should be approached when bearing N. by E., passing between it and Kobila rocks beacon, thence in mid-channel to the anchorage in port Sebenico. It presents no difficulty in a steam vessel.

**Anchorage.**—Vessels anchor where convenient a little north-westward of the harbour light. Here there are several white mooring buoys, but they do not allow swinging room for large vessels.

There is also good shelter in San Pietro bay in 10 to 12 fathoms, mud. There are a number of mooring and warping buoys in San Pietro and Maddalena bays. In Kerka inlet, the water is much deeper, and vessels must be careful to avoid the telegraph cable; see page 187.

The Bora is severely felt here, but the port is a good commodious anchorage.

**Prohibited anchorages.**—Vessels are prohibited from anchoring on a line N.N.E. of Kulina point, in the vicinity of a submarine water conduit, the landing points being marked by notice boards with reversed anchors painted on them.

To prevent Jadria point light being obscured, vessels are prohibited from anchoring in the western approach to San Antonio channel in the area included between the bearings N. 42° E., through east, to S. 82° E. of that light.

**Tides.**—It is high water, full and change, at port Sebenico, at 6h. 26m.; the rise is about a foot.

**The town** of Sebenico is approached from the sea by the San Antonio channel, and is in the form of an amphitheatre and picturesquely situated close to the water, at the base of the barren Tartaro mountain, which, at 3½ miles inland, rises 1,627 feet above the sea. It was formerly considered the strongest city of Dalmatia, and in 1807 was unsuccessfully besieged by 40,000 Turks, but the town and fortifications are now almost in ruins; the cathedral is reckoned the oldest and finest in Dalmatia.

It has about 10,000 inhabitants, who cultivate the vine and olive on a not very fruitful soil, and export horses and cattle to Naples from Bosnia.

Sebenico is in railway communication with Spalato, the line passing through the valleys inland from the one port to the other; and also with Knin 25 or 30 miles in the interior, the line to this place branching off from the Sebenico-Spalato line. There is also a high road leading to Zara, Spalato, and the interior of Dalmatia.

**Coal and supplies.**—The Austrian Government keep about 6,000 tons of Welsh coal here. Coal from the mines of Monte Promina, at 15s. or 17s. per ton, can be obtained, about 2,000 tons being usually in stock, but it is very sulphurous and for steaming purposes must be mixed with other coal. It is put on board vessels alongside the embankment; lighters are scarce. There are no other supplies of any consequence except water, which is good and plentiful.

Chart, 2,774 [801].  
 Var. 7° 55' W.  
 Lat. 45° 49' N.  
 Long. 15° 53' E.

**Kerka river** empties itself into the Proklian lake and from thence to the Kerka inlet at the north-western part of port Sebenico; its source is at the base of the Dinara mountains, and after receiving several mountain torrents, it forms a celebrated waterfall about 2 miles above Scardona, which place is about 9 miles distant from Sebenico by water. It is navigable by small vessels up to Scardona, near which place are the coalfields of Dubrovica.

Scardona is now a village, but was once a large and handsome town, between which and Bosnia there is still considerable commerce and a small steamer plies daily between it and Sebenico.

Lake Proklian, which receives the waters of the Kerka, produces the *skilli*, a fish highly esteemed, and communicates with the basin of Sebenico 3 miles above the town.\*

Lat. 43° 38' N.  
 Long. 15° 56' E.

**PORT SEBENICO VECCHIO**, (Old Port) 6 miles southward of Sebenico, is formed between a long hilly peninsula southward of the Sebenico channel and the mainland on the south; it is a narrow inlet about 2½ miles deep, with a depth of 25 fathoms at the entrance and 12 fathoms about 1½ miles inside, where large vessels anchor. North-westerly winds raise a heavy sea near the entrance. This port is not often visited owing to the vicinity of port Sebenico, which is preferred to it. There is a village at the head of the inlet.

The island of Plana, 108 feet high, lies off the southern point of entrance.

Sebenico Vecchio may be recognised by a long ancient wall on the heights; in entering it, a small vessel, under favourable circumstances, may pass on either side of Plana island. A rocky bank with 3½ fathoms lies just southward of the south-western point of Plana, and the southern point of entrance to the inlet is bordered by shallow water and a rock.

Plan of port  
 Capočesto on  
 chart, 2,774 [801].  
 Lat. 43° 35' N.  
 Long. 15° 55' E.

**PORT CAPOČESTO**, about 3 miles southward of Sebenico Vecchio, is between the point on which Capočesto village stands and the sugar-loaf shaped peninsula to the southward terminating in Kremik point. It is a semi-circular bay about half a mile wide and the same deep, with 12 to 16 fathoms water in the centre. It is a good although a small port and vessels secure to the shore.

**LIGHT.—Kremik point.**—At about 45 yards within the extreme of Kremik point, south side of the entrance, a *fixed white* light (unwatched) is exhibited from an iron turret 24 feet high, at an elevation of 33 feet above the sea, visible in clear weather from a distance of 5 miles. The light is obscured between the bearings N. 23° E. and N. 35° E., over the 2½-fathoms rock distant about 6½ cables south-westward from the lighthouse.

**Telegraph.**—Capočesto is connected with the general telegraphic system.

Chart, 2,774 [801].

**Capočesto islets.**—Between Capočesto and Planka point, at 6 miles south of it, there are several islets, rocks, and shoals, known by this name. The largest of them, Maslinovac, 131 feet high, is about a mile south-westward of the village and half a mile westward of Kremik point. Vessels bound to Capočesto from the southward usually pass between this island and Kremik point. A rocky shoal with 2½ fathoms water lies in the fairway of this passage and may be avoided either by keeping close to the

\* In 1883, H.M.S. *Helicon* anchored in 17 fathoms at the head of Kerka inlet, port Sebenico, at the junction of Zaton creek with the stream from Proklian lake. Her boats ascended to the waterfall about 2 miles above Scardona. The turnings are reported to be very sharp and difficult for even a small vessel below Scardona; above that village, a deep and navigable channel for boats only exists quite up to the falls which are well worth a visit. Just above Scardona, the river is spanned by a telegraph wire about 80 feet above the water.

eastern side of the above islet, or to the main coast near the entrance of port Peles. Chart, 2,774 [801].  
Var. 7° 50' W.

**Shoals.—Beacon.**—Grgovac islet, 7 cables westward of Maslinovac, has a shoal with less than one fathom nearly 3 cables S.S.E. from it; on this shoal, erected in 5 feet water, is a beacon consisting of an iron staff with an open-work ball surmounted by an iron flag, the whole being 28 feet high and painted white.

Grgovac has also a patch with  $3\frac{1}{4}$  fathoms about a quarter of a mile off its north-eastern side, and a rocky bank with  $5\frac{1}{2}$  fathoms lies  $1\frac{1}{4}$  miles S.W. by W. of it.

When bound to Capoĉesto from the southward, unless in a small vessel and with good local knowledge, it is prudent to leave all these islets and shoals on the starboard hand.

**Port Peles.**—This small inlet, close southward of Kremik point has a depth of 7 fathoms, muddy bottom, in the middle of its northern branch, where small craft may moor in safety. The southern branch is more contracted and less secure, and is fit for boats only, which should moor under one of the points projecting from the southern shore, to shelter themselves from the sea sent in by westerly winds. Plan of  
Capoĉesto on  
chart, 2,774 [801].  
Lat. 43° 34' N.  
Long. 15° 56' E.

**PORT ROGOZNICA** is a spacious bay,  $1\frac{1}{2}$  miles northward of Planka point, nearly circular and surrounded by barren hills. The entrance is between Beli hrt point on the northern side, and Konja point on the southern side, where there is a mid-channel depth of 34 fathoms. The bay is divided into two parts by Rogoznica islet, on the north-western side of which is the village; there is a white mooring buoy abreast the village. Plan of port  
Rogoznica, on  
chart, 2,774 [801].  
Lat. 43° 31' N.  
Long. 15° 59' E.

Vessels anchor westward of the village in depths of 12 to 17 fathoms, or between the northern part of Rogoznica islet and the shore eastward of it, in 15 to 17 fathoms, mud, sand, and weed; or farther up, in 10 to 12 fathoms. Vessels may safely heave down in this port for repairs. Small craft moor on the western side of the islet and secure to the shore at the southern part of the village. Port Rogoznica is safe in all winds and the entrance is easy. The surrounding country is very barren. Fossil remains are numerous at Rogoznica; also at several of the islets in its neighbourhood. Water may be procured from the mainland.

**LIGHT.**—On point della Madonna, the north entrance point of port Rogoznica, a *fixed green* light, elevated 17 feet above the sea, is exhibited from an iron standard; it is visible from a distance of 2 miles.

**Telegraph.**—Rogoznica is a telegraph station.

**Mulo islet**, a little more than half a cable in diameter and 28 feet high, is the outer islet off port Rogoznica, and lies  $1\frac{1}{2}$  miles westward of the entrance. It is nearly steep except on the northern side, which is rocky half a cable off, and has on it a white lighthouse. See view on chart No. 2,774.

**LIGHT.**—The lighthouse on Mulo islet is an octagonal stone tower, with two-storey dwelling attached, 58 feet in height, and from it is exhibited at an elevation of 77 feet above the sea, a *fixed white* light, Lat. 43° 31' N.  
Long. 15° 55' E.

Plan of port  
Rogoznica on  
chart, 2,774 [801].  
Var. 7° 50' W.

visible in clear weather from a distance of 14 miles. Noted on chart as unreliable.

**Spaun rock.**—Nearly a mile N. by W. from Mulo lighthouse is a rocky shoal about  $1\frac{1}{2}$  cables in extent with from 2 to 3 fathoms on it and from 6 to 8 fathoms around; the Spaun rock, with two fathoms, is in the centre of the shoal. The south extreme of Rogoznica islet on with point della Madonna, leads 3 cables northward of the rock. To pass southward of the rock, keep the northern extreme of Konja point in line with the north extreme of the northern Smokvica islet, and pass within half a mile of Mulo lighthouse.

Lat. 43° 31' N.  
Long. 15° 56' E.

**Smokvica islets** are two islands off Konja point, about  $1\frac{1}{2}$  cables apart, with a depth of from 7 to 14 fathoms between them; the southern islet is the larger of the two and is 157 feet high. Shallow water extends more than a cable from the north-western end of each islet; and, N.W. by W.  $3\frac{1}{2}$  cables from the centre of the northern islet, is a rocky 3-fathoms patch.

North-eastward of the southern end of the larger Smokvica is the little islet Kalebinjak, having a deep passage about 2 cables wide into port Rogoznica between it and the mainland.

**Directions.**—To approach port Rogoznica, the entrance of which is open to the westward, a large vessel should pass outside the islets. To enter northward of the Spaun rock, the southern end of Rogoznica islet shut in with point della Madonna lighthouse until Mulo lighthouse bears about S. by W. leads well clear of it, and the same line leads to the entrance; then steer in mid channel or as convenient.

To approach the port southward of the Spaun rock, steer for Mulo lighthouse, pass at a prudent distance on either side of it, and then, in order to avoid the 3-fathoms patch north-west of Smokvica islets, bring Mulo lighthouse to bear S.W., and steer N.E. until the southern end of Rogoznica island bears E.S.E., then steer for it. A small vessel may take the narrow passage between Konja point and the islets off it, but should guard against the current and be prepared to anchor if necessary.

---

General chart, 1,440 [789].

## CHAPTER VII.

COAST OF DALMATIA FROM PLANKA POINT TO STAGNO  
PICCOLO, AND ADJACENT ISLANDS.

FROM Planka point to Stagno Piccolo includes an extent of about 100 miles of the Dalmatian coast, which coast presents a diversified appearance of fertile well cultivated country, and of dry barren shores, with high bare-topped mountains in the rear.

Charts,  
2,712 [803],  
2,774 [801],  
Var. 7° 50' W.

The islands eastward of Planka point, instead of trending parallel with the coast as those described in the previous chapter, lie more at an angle with it, in an east and west direction. The olive and the vine are cultivated on them, and fishing is carried on in the numerous and productive channels. Few of the islands afford fresh water.

**PLANKA POINT**, lying  $2\frac{1}{2}$  miles south-eastward of Mulo lighthouse, is composed of white rocks, and, like the adjacent shores, is steep and inaccessible; off it is a low rock nearly even with the water's edge. On its southern extreme are the ruins of a small church, and close to the northward, but separated from Planka point by the small but deep inlet named Planka cove, is mount Movar, of barren and whitish aspect, surmounted by a stone column 432 feet above the sea. Sailing vessels often make this point in their way up the Adriatic, but the currents are rapid in its vicinity and sea winds cause considerable eddies around it.

Lat. 43° 29' N.  
Long. 15 58 E.

**Trau Vecchio bay**.—Between Planka point and the Zirona channel 3 miles further east, there are three rather deep bays named Sicinice, Manera, and Trau Vecchio, with steep rocky shores, which afford shelter from all but westerly winds. Trau Vecchio, the easternmost, is the largest and best; it is open to the south-west, and affords anchorage in depths of 11 to 17 fathoms, sand. Three or four small islets front these bays, of which St. Arcangelo, 295 feet high and the largest, lies about a quarter of a mile off the south-eastern point of Trau Vecchio bay.

Lat. 43° 29' N.  
Long. 16 2 E.

There are safe passages between the two small Muja islets westward of St. Arcangelo islet, between them and the latter islet, and also between them and the coast.

St. Arcangelo islet is a good distinguishing mark for the bay, being covered with trees and surmounted by a tower and the ruins of a chapel. At the head of Trau Vecchio bay are the ruins of ancient Trau.

If in a small sailing vessel, when running from the northward for shelter eastward of Planka point, the Trau Vecchio anchorage be missed, proceed through the Zirona channel to port St. Giorgio, in Great Zirona island, on the south side of the channel.

**Port Mandoler** is a narrow inlet in the mainland opposite Great Zirona island; it recedes about a mile in a north-westerly direction and affords shelter to small vessels from all winds in depths of from 4 to 10 fathoms abreast some dwellings on the northern shore. Off the mouth

Lat. 43° 29' N.  
Long. 16 7 E.

Charts,  
2,712 [803],  
2,774 [801],  
Var. 7° 50' W.  
Lat. 43° 26' N.  
Long. 16 4 E.

of the port is **Mandoler rock**, 10 feet high, on either side of which vessels may pass on entering.

**Little Zirona island**, on the south side of Zirona channel, is nearly  $2\frac{1}{4}$  miles in extent east and west, 262 feet high, barren at the summit, with cultivated patches below. It is steep to except on its north-western side, which is foul. Temporary shelter from a Bora may be obtained in Rina road, under its south-western side, in a depth of 8 or 9 fathoms, sand and weed.

**GREAT ZIRONA ISLAND** is 3 miles in length east and west, and its north-eastern part is 580 feet high. It resembles Little Zirona as to cultivation of the lower grounds and barrenness above. Off the eastern extreme are two small islets close to the shore, connected with it and with each other by shallow water; elsewhere the coast is quite clear. There are about 2,000 inhabitants, who cultivate the vine, fig, and almond.

Lat. 43° 27' N.  
Long. 16 8 E.

**Port St. Giorgio**, on the north-western side of Great Zirona island affords good anchorage. Vessels of moderate size anchor near the middle of the port in depths of from 13 to 16 fathoms, sand, and secure to the shore. The two entrance points are high and covered with trees; on the southern shore is a church which is visible at some distance. The town is at the head of the port; here water and provisions in small quantities may be procured.

The little islet of Malta, 90 feet high, lies about half a mile westward of the southern point of entrance to port St. Giorgio.

Lat. 43° 28' N.  
Long. 16 5 E.

**ZIRONA CHANNEL** is the passage between the Zirona islands and the mainland; it is about a mile wide, with deep water. At the western entrance is a 9-fathoms patch, and the small islet Murvica, 92 feet high, has round it shoal water extending about half a cable.

Lat. 43° 28' N.  
Long. 16 3 E.

**LIGHT.—Murvica.**—On the summit of Murvica islet a *fixed and flashing* light is exhibited from a square tower on the side of a dwelling, 23 feet high, at an elevation of 52 feet above the sea, showing thus:—Fixed, *fourteen seconds*; eclipse, *seven and a half seconds*; flash, *one second*; eclipse, *seven and a half seconds*. The light is visible in clear weather from a distance of 12 miles.

**Directions.**—In entering from the westward, a vessel should pass between Murvica islet and Little Zirona, that being a straight course, but the shore of the mainland is everywhere clear and bold. Coming from the eastward, the shore of Great Zirona island should be closed in order to leave on the starboard hand the Kluda chain of small islets and rocks fronting the entrance to Bossiljina bay. Violent squalls reach this channel, especially in south-easterly winds, and these winds greatly accelerate the current through it.

There is a passage between the two Zirona islands, but it is seldom used as the current causes considerable eddies in it.

(Chart,  
2,712 [803].

**TRAU BAY and approach.**—Trau bay is 6 miles in length, from a half to one mile in breadth, and about one mile wide in the entrance, which is deep. The Kluda and other islets lie in the approach, but within the entrance, at either end of the bay, there is secure anchorage as described on following page.

**Kluda islets.**—This chain of small islets and rocks, extending eastward and westward over a space of  $1\frac{3}{4}$  miles, lies on the northern side of the Zirona channel opposite the eastern end of Great Zirona island, and in front of the entrance to Trau bay. The largest islet, named Kluda, is at the western end of the group, and is 164 feet high. The others are named Galera, Piavice, Zapcrinovac, and Balkun; they should not be

approached too closely. At three-quarters of a mile westward of Kluda are two shoal heads with 5 and  $5\frac{1}{2}$  fathoms water.

**LIGHT.—Galera.**—From an iron turret 25 feet high on the summit of Galera islet, about three-quarters of a mile east-south-east of Kluda, a *fixed white* light (unwatched) is exhibited at an elevation of 34 feet above the sea, visible in clear weather from a distance of 8 miles.

**St. Eufemia islet** lies on the east side of approach to Trau bay, near the south-western extreme of Bua. The anchorage northward of the island is frequented by small craft which anchor in a depth of 7 to 9 fathoms. This anchorage is convenient for vessels meeting a contrary wind in the Spalato channel; it has an eastern and a western entrance, the former is over the shallow 2-fathoms bank which unites St. Eufemia with Bua island.

Krabjevac islet, 111 feet high, westward of St. Eufemia, is connected to the latter by a flat with 3 fathoms over it.

**The Celini rock**, 45 feet high, with four shallow rocky patches, encumber the entrance to the bay, especially for vessels of deep draught; the passage in is between Celini rock and a 4-fathoms patch on the one side, and Okrug point, the western end of Bua from which a shoal extends a cable westward, on the other. The shoal patches north-westward of Celini rock have 5 and 2 fathoms water; the latter depth is near the northern shore.

**Bossiljina bay** is the western arm of Trau bay, extending westward about 3 miles, and generally about half a mile wide. It is completely sheltered by the high land, which rises 938 feet above the sea,  $1\frac{1}{2}$  miles westward of Jelinac point at the entrance, and its shores are backed on the north by high, wooded, mountainous land, the seaward slopes of which are planted with vines and olive trees. The village is at the head of the inlet.

In the middle, about half way in, the depth is 20 fathoms, from which the decrease is gradual towards the village. Vessels anchor half way between the two shores in 7 or 8 fathoms. Small craft moor in the various little creeks and abreast of the village.

It is difficult with contrary winds to work into this bay, in consequence of the off-lying islets and rocks outside and within the entrance, and impracticable for a sailing vessel to quit it with winds between N.E. and S.E. For these reasons, Bossiljina bay is seldom visited by other than coasters. The passage into the bay is about half a mile wide between Jelinac point and Celini rock and the shoals north-eastward of that point.

**Bua island** forms the eastern side of Trau bay, is about  $8\frac{1}{2}$  miles in length east and west, and, in the centre, 715 feet high; it is connected with the town of Trau, which stands on an islet connected with the mainland, by a swing bridge. Its appearance presents nothing remarkable; the higher parts are rocky and bare, the lower ground is well cultivated and produces wine, oil, fruit, and vegetables. It has four villages and about 1,600 inhabitants. On the western side of the island is a cove where a great quantity of asphaltum exudes. The southern coast, which trends parallel with the mainland, is rocky and steep almost throughout with deep water close to.

**Saldon bay**, the eastern arm of Trau bay, on the north-east side of which is the town of Trau, communicates with the Canale Castelli by the Trau channel. Vessels of deep draught anchor near the middle of Saldon bay in a depth of 14 fathoms, mud and gravel, with Zubrian point

Chart,  
2,712 [303].  
Var. 7° 50' W.  
Lat. 43° 28' N.  
Long. 16 11 E.

Lat. 43° 30' N.  
Long. 16 12 E.

Chart, 2,712 [803].  
Var. 7° 45' W.

Port of port  
Trau,  
1,612 [804].

Lat. 43° 31' N.  
Long. 16 15 E.

Chart,  
2,712 [803].

bearing about N.  $\frac{1}{2}$  W. Small vessels find good anchorage under the northern and southern shores.

**TRAU CHANNEL**, with depths of  $2\frac{1}{2}$  to  $6\frac{1}{2}$  fathoms, is the narrow channel which connects Trau bay with Canele Castelli, northward of Bua island, over which is a swing bridge, as before stated; the depth under it is sufficient to permit vessels of about 15 feet draught to pass through. The narrows is marked by stakes, white on the northern side, red on the southern. Near the western entrance a white pile beacon is surmounted with a circular disc, and a red pillar beacon by a similar top-mark, painted red. The channel is being improved by dredging. Vessels of light draught anchor here over muddy bottom, and with stern fasts to the island.

**TRAU**, ancient *Tragurium*, is built on an islet connected with the mainland by a bridge over a narrow passage in which there is a depth of 6 feet at low water, it is also connected with Bua island by means of two jetties, one projecting from Trau, the other from the island, joined by a swing bridge. Trau is surrounded by ancient walls and defended by a castle of some strength. The neighbouring country is well cultivated and picturesque; the inhabitants, about 4,000, are industrious and many of them good sailors. Surrounding marshes render the atmosphere insalubrious.

**The trade** is in wine, oil, and vegetables; water and provisions may be obtained, and vessels may refit here.

**Lights.**—A *fixed red* light, elevated 11 feet above the sea, is exhibited from an iron post upon stone base on Zubrian point, the north-west extreme of Bua island, and is visible in clear weather from a distance of 2 miles, when bearing from N.  $15^{\circ}$  W., through north and east, to S.  $54^{\circ}$  W.

Two small *fixed* lights are shown from the bridge which joins Bua island to Trau; these lights show *green* when the bridge is shut, and *red* when it is open.

**Telegraph.**—Trau is a telegraph station.

**Directions.**—When approaching Trau bay from any quarter, mount Vlaska 2 miles north-westward of Trau and 1,453 feet high, one of the highest points on the Dalmatian shore, will be readily recognised. It is of barren aspect and surmounted by the ruins of a telegraph tower.

Approaching from the westward, vessels may keep close along shore until abreast of Jelinac point, whence proceed as below directed for coming from the south-eastward.

When approaching from the south-eastward by the Spalato channel, the opening between Jelinac point on the west, and Okrug point on the east, will be readily recognised. After passing the Macina shoal, *see* page 202, which lies near the centre of the Spalato channel, Okrug point should be steered for, and the three islets, St. Eufemia, Kravace, and Zaporinovac, left on the starboard hand—the latter being passed closely in order to avoid the Balkun rock or islet lying half a mile westward of it. When the hilly Vranica point, which is on the right of the entrance to Bossiljina bay and immediately opposite the passage, is seen, it should be steered for, and the Celini rock will soon be visible; the latter should not be passed too closely, but should be left on the starboard hand if bound to Bossiljina bay, page 195; and on the port hand if going to Trau town or Saldon bay.

If proceeding to Trau, a vessel should round Okrug point about 3 cables distant to pass between the spit extending from the point and

Celini rock dangers, whence course may be shaped for Trau, if bound there. When approaching Trau channel, give Zubrian point a berth of a cable to avoid the shoal extending from it. Vessels may anchor in the fairway in 5 fathoms,  $1\frac{1}{2}$  cables eastward of the point. Farther in, the water becomes shallow, but vessels of 15 feet draught can pass through the channel into the Canale Castelli, as before stated.

Chart.  
2,712 [803].  
Var. 7° 45' W.

**CANALE CASTELLI** is a land-locked bay with general depths of 10 to 20 fathoms, formed within the north-eastern side of Bua island and the north-western side of Spalato promontory; it extends from the village of Vranica on the east to the town of Trau on the west, a space of about  $9\frac{1}{2}$  miles. The northern coast is bordered by a bank extending more or less from the shore, and numerous rocks and shoals encumber the eastern part of the bay, rendering caution necessary in approaching Vranica or port Paludi. It is sheltered from the violence of northerly winds by the high land near the coast, but is not free from Bera gales; the shore of Bua island between Jove point, its eastern extreme, and the town of Trau, being quite exposed, affords no shelter.

Salona, at the eastern extreme of the bay, stands on the ruins of ancient *Salona*, the birthplace of Diocletian, and is now an insignificant but picturesque village.\* The small river Salona, which is navigable for boats and whose source is at the foot of the Klissa mountains, discharges here. There are several villages along the coast of the bay, with "Castel" preceding the name, hence the name of the bay.

Lat. 43° 32' N.  
Long. 16 29 E.

A stone beacon, 6 feet high, standing in about 5 feet water, is said to mark a shoal, about 45 yards westward of Castel Vecchio, one of these villages.

A rocky shoal with  $3\frac{1}{2}$  fathoms water lies half way between the eastern extreme of Bua island and the town of Trau, and about  $5\frac{1}{2}$  cables from the shore of Bua. Westward of this shoal, the shores on either side converge and are bordered by banks forming the Trau channel, page 196.

**Castelnuovo.—Harbour light.**—From the mole-head of Castelnuovo, one mile westward of Castel Vecchio, north side of the bay, is exhibited a *fixed red* light visible in clear weather from the distance of 2 miles, between the bearings of N. 82° W., through north, to N. 50° E.

Lat. 43° 33' N.  
Long. 16 20 E.

**Galera islet.—Beacon.**—About half a mile northward of the northern point of Paludi bay, is the Galera islet, 6 feet high, on the eastern end of a shoal about half a mile in length. A shallow spot marked by a beacon is situated near the middle of the north side of this shoal.

From Galera rock to the anchorage northward of Vranica village, the centre of the channel is clear except for a sunken rock with less than 6 feet water over it lying half a mile E. by S. from Galera, but give a berth of  $1\frac{1}{2}$  cables to the rocks on the northern side of the anchorage.

**Port Paludi.**—The bay on the northern side of the Spalato promontory under mount Marian, is named port Paludi; it is bordered all round by shallow water, which from the north-eastern point extends nearly half a mile south-westward, with a depth of one fathom at its extreme, marked by an iron perch surmounted by a white skeleton ball, 18 feet above the water.

Lat. 43° 31' N.  
Long. 16 25 E.

\* Salona must have been an extensive city from the scattered ruins in its vicinity. In 1802 a fine Torso of Parian marble was found and sent to Vienna; it was  $7\frac{1}{2}$  feet in height, and represented a naked warrior seated on the trunk of a tree, against which his armour leans; it was considered as belonging to the first style of Greek art.

Chart.  
2 712 [803].  
Var. 7° 45' W.

There is also a rock about 6 feet high 2 cables westward of the north-eastern point, with from 4 to 6 fathoms water between it and the land.

Within the shoal there are depths of from 4 to 6 fathoms, and anchorage for small vessels in the north-eastern part of the bay about a quarter of a mile off the jetty, from which a road leads to the town of Spalato about a mile distant on the southern side of the peninsula.

Large vessels anchor about a third of a mile from the rock, and half a mile northward of the south-western point of the bay, in about 17 fathoms, mud.

\*Lat. 43° 29' N.  
Long. 16 23 E.

**Directions.**—The entrance from seaward to the Canale Castelli is between Jove point,\* the eastern extreme of Bua, and St. Giorgio point, the western extreme of the Spalato promontory, where 3 fathoms water will be found half a cable from the point, and a depth of about 25 fathoms in mid-channel. This entrance is about a mile wide and free from danger, but in working through in bad weather a vessel should be prepared for heavy squalls from the high land.

The position of the bay is plainly indicated by mount Marian, 598 feet high, rising from the Spalato promontory  $1\frac{1}{2}$  miles eastward of St. Giorgio point. The mount is barren and appears from the offing to be detached from the adjacent land. The tower of the convent church at Paludi is visible from a considerable distance.

As previously stated, the passage from the Canale Castelli through the Trau channel can be taken by vessels up to 15 feet draught.

Plan of port  
Spalato on  
1,612 [804].  
Lat. 43° 30' N.  
Long. 16 26 E.

**PORT SPALATO** is 2 miles eastward of the entrance to Canale Castelli; the intervening shore is rocky and steep-to, except a small shoal extending from the point about two-thirds of a mile eastward of St. Giorgio point.

The port of Spalato is about 6 cables wide and 4 cables deep, with a depth of 4 to 5 fathoms, mud, in the centre, shoaling to  $1\frac{1}{2}$  fathoms rocky bottom at a cable from its head, and a similar depth at nearly the same distance from the western shore, which is irregular and rocky.

From the eastern point of entrance, a mole projects about  $2\frac{3}{4}$  cables towards the western point, affording great protection to the port; from the inner end of the mole, a wall extends along the eastern shore of the port and terminates at a shorter inner mole jutting out westward from the site of the barracks.

Two large jetties are built out, 200 and 160 yards respectively, from the eastern shore, alongside which the depth is from 18 to 24 feet. From the western part of the town, another small mole projects towards the inner mole, leaving an opening rather more than a cable wide into a smaller inner harbour faced with quays, in which the depth is from 6 to 12 feet.

**Town.**—The town of Spalato, which contains within it the ruins of the palace of Diocletian, is the capital of the department of Spalato and the most important town of Dalmatia; its population in 1906 numbered 19,000. It is in direct railway communication with Sebenico, and also with the town of Knin, some 25 or 30 miles in the interior, by means of a line branching off at Perkovic from the Spalato-Sebenico line. The adjacent country contains several suburbs, is very fertile, and richly cultivated.

The outer walls of Diocletian's palace, which form a square, still in great part exist, and enclose a large part of the town. The cathedral or Duomo is a most remarkable and conspicuous building; it is octagonal with a

curious portico around it, whilst within are two ranges of columns of granite and porphyry, one above the other, with a gallery between them in which a whispering echo is observed. Other considerable remains of imperial buildings are seen within the precincts of the town.

**Trade.**—Horses, cattle, wool, cotton, silk, figs, bees-wax, and copper, are the exports; timber for shipbuilding is grown, and near the town among the vines, is the wild cherry from which is extracted the maraschino of Zara: Spalato is the chief outlet for the produce of Bosnia and is defended by imposing fortifications.

**Outer anchorage.**—The roadstead of Spalato affords anchorage in depths of from 22 to 27 fathoms at a distance of 2 to 6 cables southward of the breakwater, over a good mud bottom, but it is not a desirable anchorage in the winter. Paludi bay is better at that season, as the Bora is less felt there.

**LIGHTS.—Outer molehead.**—From a grey iron octagonal tower 31 feet high, 8 yards within the head of the Botticella point mole, a *fixed* and *group-flashing* light, with a period of *forty seconds*, is exhibited, at an elevation of 34 feet above the sea, showing thus:—Fixed for *twenty seconds*; a group of eight quick flashes, occupying *twenty seconds*; within a distance of 7 miles the eclipses are not total. The light shows *white* when bearing from N. 67° W., through north, to N. 78° E.; *red* from N. 78° E., through east, to S. 64° E., in the direction of St. Stefano point; *white* from S. 64° E., through south, to S. 81° W.; obscured from S. 81° W. to N. 67° W., over the shoals extending from the direction of Botticella point; it is visible in clear weather from a distance of 11 miles.

Plan on  
1,612 [804].  
Var. 7° 45' W.  
Lat. 43° 30' N.  
Long. 16° 26' E.

**Inner eastern mole-head.**—On the Inner eastern molehead, a small *fixed* light is exhibited, elevated 17 feet above the sea and visible one mile; it shows *green* towards the entrance of the port when bearing from about N. 24° W., through north, to S. 84° E.; *white* elsewhere.

**St. Pietro mole.**—A *fixed red* light, elevated 17 feet above the sea, which can be seen one mile, is exhibited from the head of St. Pietro mole, visible between the bearings of N. 43° W., through north and east, to S. 43° E.

**Anchorage.—Buoyage.**—Botticella bank in the south-eastern corner of the port is marked by four buoys. The shallows extending from the shore are marked by quadrangular beacons or buoys with the depth in which they are moored painted on them. Several mooring buoys are also laid down for warping or making fast to; the two nearest the railway station are meant exclusively for the Austrian Lloyd's steamers; those close inshore are only for small vessels. The port affords anchorage in depths of 4 to 5 fathoms, mud and shells.

**Directions.**—Mount Marian on the west, and Klissa castle, about 5 miles north-eastward of Spalato, on the east, are good guides to the port at a distance; on a nearer approach the numerous edifices and steeples of the town will be seen. There is no difficulty whatever in entering the port.

If a vessel surprised by a Bora in this neighbourhood should be unable to reach either Spalato or an anchorage in the Canale Castelli, she should bear up for the western side of Brazza island.

**Telegraph.**—Spalato is a telegraph station.

**Salvage.**—The tender *Salona*, of 40 tons, is available for salvage purposes.

Plan on  
1,612 [804].  
Var. 7° 45' W.

**Coal and Supplies.**—Coal from the Promina mines may be obtained, about 3,000 tons being usually in stock; this coal is full of sulphur, and unless mixed with good coal is almost useless for steaming purposes. From 100 to 200 tons of English coal may also be obtained. The depth alongside the coal wharf is from 16 to 19 feet. Water and provisions may be procured in abundance, and there are facilities for heaving down and repairs. A hydrant for the exclusive use of the Imperial and Royal Navy, from which other vessels of war can supply themselves free of cost with excellent drinking water, is situated near the wooden landing, and opposite the railway station. Application should be made to the Harbour office.

Chart  
2,712 [803].

**SOLTA ISLAND**, the next large island south-east of Great Zirona, is 10 miles in length and averages about 2 miles in width, except towards its south-eastern end, where it is narrower. It consists of numerous rocky hills partially wooded; mount Straza,\* 682 feet high, about one-third from the western end and on the southern side, has on it the remains of a telegraph station; but its highest part is mount Superior, 777 feet above the sea, about one-fourth from the south-eastern end.

Solta contains about 3,200 inhabitants; it has some excellent pasturage and many parts are well cultivated, producing wine, oil, and also honey of exquisite flavour.

Along the south-western coast, which is rocky and steep, are many little coves, but so completely exposed to sea winds as to afford no shelter whatever.

At the western extreme, off which are several rocky islets, are two inlets; in the northernmost, small vessels find shelter from all weather, and off the southern, between the points of the bay and Balkun islet, there is temporary anchorage for small vessels during northerly and easterly winds.

**Port Oliveto**, ancient *Olynta*, is the more northern of these two inlets and the village of Oliveto is at its head. When bound to this port from the northward, the passage between Stipanska and Zelebranjak islets should be taken and the vessel should keep along the western side of the latter and haul to the eastward after passing it.

Stipanska, 223 feet high, is the largest and outermost of this group of islets and is planted with olive trees.

When bound to the port from the southward, Balkun islet, 174 feet high should be steered for and the passage taken between it and St. Nicolo point, the high point of Solta, on which is a church and at its foot a lighthouse. Rotol, the south-western islet of the group, should be allowed a berth of more than a cable in passing. The little islet of Kamicic, 61 feet high, has a spit extending from its western side.

**Light.**—On St. Nicolo point, the southern point of entrance to port Oliveto, is exhibited from a white stone lighthouse, 24 feet high, at an elevation of 34 feet above the sea, a *fixed* light showing *red* when bearing from N. 19° E. (leading about one cable eastward of Kamicic islet) to N. 64° E.; *white* elsewhere; it is visible in clear weather from a distance of 3 miles.

In approaching Oliveto from the Solta channel, this light is visible through the narrow and shallow passage between Solta and Zelebranjak islet; but, as before directed, the channel to be taken is that between Zelebranjak and Stipanska islets.

**Karober cove** is an inlet about the middle of the northern coast of Solta and is frequented by coasters which anchor in the centre of it and

Lat. 43° 24' N.  
Long. 16 18 E.

secure to the shore near some storehouses. A mooring buoy is placed about a cable north-westward of Glavica point. The position of the cove is easily recognised by a precipitous hill 669 feet high and covered with vines, contiguous to a tract of low land; and, nearer the coast, a grotto will be seen westward of the port.

**Light.**—From an iron standard on Glavica point, western side of port Karober, a small *fixed white* light, elevated 34 feet above the sea, is exhibited, visible in clear weather from a distance of 3 miles, between the bearings S. 29° E., through south and west, to N. 19° E. The light in sight leads eastward of Macina shoal.

**Port Sordo**, just eastward of Karober cove, has more room and is used in southerly and westerly winds by larger vessels than those frequenting the latter. The port is nearly a mile in length; the anchorage is in depths of from 9 to 15 fathoms, mud, and is somewhat protected from north-easterly winds.

Lat. 43° 23' N.  
Long. 16 19 E.

**The northern coast** of the island is exposed to the full force of northerly and north-easterly winds, and the two last-mentioned ports are the only places affording any shelter whatever.

**SOLTA CHANNEL.**—In taking this channel between Solta and Great Zirona islands to the Spalato channel, the eastern extreme of the latter island should be avoided as the current which is rapid and irregular in branching off to the Zirona and Solta channels, sometimes sets on it.

Lat. 43° 25' N.  
Long. 16 10 E.

The water is deep with the exception of a rocky 3½-fathoms shoal in the fairway about midway between Stipanska and Macaknar islet, and a 5½-fathoms patch in the northern part of the channel, 6 cables S.E. by E. ¼ E. from Karknjase islet.

The best channel is between the 3½-fathoms patch and Stipanska islet, towards the latter, after passing which Solta should be closed, in order to avoid being carried by the current towards Macina shoal.

**SPALATO PASSAGE**, which is the shortest route from the southward to ports in the Spalato channel, separates Solta and Brazza islands; being less than 4 cables wide, it is of rather difficult navigation in a sailing vessel with contrary winds when the current is strong; the least mid-channel depth is 13 fathoms, but the shore on either side should not be approached within half a cable, the Brazza side being preferred. When passing through from the southward, Smerduglia islet, 22 feet high, will be seen through the pass at the northern entrance.

Lat. 43° 20' N.  
Long. 16 24 E.

When making for this passage from the Spalato channel, it is customary to pass westward of Smerduglia islet.

**LIGHT.**—On Speo point, 3 cables northward of Jaja point, the south-western extreme of Brazza island, and the south-eastern point of entrance to the Spalato passage, is an octagonal white tower attached to dwelling, 47 feet high, from which is exhibited at an elevation of 55 feet above the sea, a *fixed white* light, visible in clear weather from a distance of 10 miles, between the bearing of S. 8° W., through south and east, to N. 37° W.

Lat. 43° 19' N.  
Long. 16 24 E.

**SPALATO CHANNEL.**—The width of this channel between Zirona and Solta islands on the south, and Bua and the coast of Spalato on the north, renders it easily navigable, the current, which sets westward, not being very strong. The average depth is about 30 fathoms, and the bottom throughout is mud.

Lat. 43° 27' N.  
Long. 16 18 E.

Chart,  
2,712 [803].  
Lat. 43° 27' N.  
Long. 16 14 E.  
Var. 7 45 W.

**Macina shoal.**—This rocky shoal, with less than one foot water over it, is the only danger in the channel; it lies nearly opposite the northern entrance to the Solta channel, about midway between the shore of Solta island and St. Eufemia islet, is of small extent, and is surrounded by deep water. A small shoal, with a depth of 6 fathoms, lies N.W. by W.  $\frac{1}{2}$  W., distant nearly half a mile from Macina shoal.

**Beacon.**—A white iron staff with skeleton ball at present marks Macina shoal, but, in this exposed position, well-constructed beacons have so often been washed away that its existence should not be depended on.

**THE COAST** between port Spalato and Stobrez village, 4 miles eastward, is inaccessible and bordered by high land; about midway, a few yards from the shore, is a small 5-fathoms shoal supposed to be the remains of an ancient dock. Between the village and a point 2 miles westward of it, there is a ridge which extends  $2\frac{1}{2}$  miles south-westward, with general depths of 6 to 10 fathoms; but at one mile from the shore there is a patch of  $4\frac{1}{2}$  fathoms and at nearly 2 miles from the shore, a patch of  $5\frac{1}{4}$  fathoms. About three-quarters of a mile eastward of the tail of this ridge is a bank with from  $6\frac{1}{2}$  to 10 fathoms water, and a patch with 7 fathoms at one mile south-west of the latter.

Lat. 43° 30' N.  
Long. 16 31 E.

**Stobrez cove.**—Stobrez village—the site of the ancient *Epezio*—stands on a projecting point forming the western side of Stobrez cove and is visible at some distance; the cove is a small indentation into which the river Xernovica empties itself; small vessels anchor on its eastern side, but the north-western side is shallow. The Bora blows severely here.

The coast between Stobrez cove and Almissa road, 8 miles south-eastward, is accessible throughout. The country for about a mile inland is richly cultivated, with numerous dwellings here and there. Oil, wine, and maraschino are the products. The land rises abruptly at the margin of this cultivated ground to rocky mountains of whitish aspect, from 1,450 to 1,950 feet high, which afford protection from northerly winds to the vegetation below.

**Anchorage** in good holding ground may be obtained during a Bora all along this shore at a short distance from it, but not near any of the salient points.

Lat. 43° 28' N.  
Long. 16 34 E.

**A telegraph cable** is laid from Monte Grosso point  $2\frac{3}{4}$  miles south-eastward of Stobrez cove to Vela Luka cove in Brazza island.

**Lunga point**, 6 miles south-east of Stobrez cove, projects and is bordered by shallow water, the south-western edge of which is marked by a group of wooden stakes in 9 feet water, surmounted by an iron staff with two white, open-work circular discs, placed vertically, 11 feet above high water.

Plan of Almissa  
road on  
1,612 [804].  
Lat. 43° 26' N.  
Long. 16 41 E.

**ALMISSA ROAD.**—Between Lunga point and Malaluka cove,  $3\frac{1}{2}$  miles to the south-east, the shore recedes nearly a mile, and in the bight is Almissa road. There is anchorage in a depth of about 14 fathoms, mud, off the monastery of San Francesco, which stands near the shore about half a mile south-eastward of the town; vessels of light draught moor near the shore, to which they secure against the Bora, which wind, however, does not blow so violently here as on other parts of the coast.

The north-western shore of the road is bordered by a bank, steep-to but extending 3 to 4 cables from the shore; this bank is the deposit from the Cetina river, has from 3 to 6 feet water on its edge, and from 6 to 12 fathoms close to.

**The town** of Almissa—ancient *Onurum*—is on the eastern bank, at the entrance of the Cetina river, and at the foot of a mountain on the summit of which at 1,020 feet above the sea stands the old castle of Mirabella. Almissa was formerly a considerable and fortified place, but was destroyed by the Venetians owing to the piratical habits of its inhabitants; it is now almost deserted, being rendered very insalubrious by the neighbouring marshes.

Mount Kosik, of the Mossor range, rises 4,324 feet above the sea about 2½ miles northward of Almissa. Mount Borak, 2,635 feet high, 2 miles south-eastward of Almissa and about a mile from the sea, marks the position of the town and anchorage; its peaked summit of naked rock commands an extensive view of the surrounding country.

**Lights.**—From the piazza of the Franciscan convent, at an elevation of 26 feet above the sea, a *fixed* light is exhibited, visible in clear weather from a distance of 5 miles, and showing *red* when bearing from N. 79° E. (clear of the bank westward of the town), through north, to N. 18° W.

Plan on 1,612 [804].  
Var. 7° 40' W.  
Lat. 43° 26' N.  
Long. 16° 42' E.

On the angle of the pier at Almissa, a small *fixed white* light is exhibited 17 feet above the sea, and visible at the distance of 2 miles when bearing from N. 74° E., through north and west, to S. 2° W. During northerly gales it may not be exhibited.

**Cetina river**—ancient *Nestus*—is one of the chief rivers of Dalmatia; its source is at the base of mounts Dinara and Glignat on the Bosnian frontier, from whence it flows through Sign and Trigl, near Duare castle, where is the finest of its many cascades, and from thence through Vissech to the sea at Almissa. It is navigable by boats drawing about 3 feet as far as the mills of Vissech; the passage over the bar, on which there is little more than 3 feet, requires local knowledge.

**Telegraph.**—There is a telegraph cable laid between Velika Luka, situated a short distance south-eastward of Malaluka cove, and a small cove just west of the lighthouse at Pucisce on the opposite shore.

**THE COAST** from the base of mount Borak trends east-south-eastward 7½ miles to Vrullja cove, and then south-eastward 8½ miles to port Makarska. It is backed close inland by high rocky mountains. At Vrullja is a sudden depression, southward of which the mountains rise to a still greater height than before, and this is maintained for 23 miles south-eastward of Makarska as far as the mouths of the Narenta river. The low grounds between the mountains and the sea are generally cultivated and contain several villages, of which Rogosnica\* on an eminence 2 miles south-eastward of mount Borak is the most conspicuous, being visible from a considerable distance along the seashore on either side of it.

\*Lat. 43° 25' N.  
Long. 16° 46' E.

There is no safe anchorage between mount Borak and Vrullja. Vrullja cove itself is difficult of approach by sailing craft, owing to strong eddies caused by subaqueous springs; the depth near it is considerable, being 39 fathoms at the entrance and 22 fathoms close to the shore. The Bora, when blowing, rushes with violence through the valley. The land in the vicinity has a barren, desolate appearance.

Between Vrullja cove and the town of Makarska the coast has the same appearance. Coasters anchor for shelter from the Bora, securing with cables to the shore, in Cerkalije cove,\* a small bend in the coast at Brela village; also at Soline and Baskavoda coves close to the shore, to which their cables are secured.

\*Lat. 43° 23' N.  
Long. 16° 55' E.

Water may be obtained at Baskavoda from springs.

Plan of port  
Makarska on  
1,612 [804].  
Lat. 43° 17' N.  
Long. 17 1 E.  
Var. 7° 30' W.

**PORT MAKARSKA.**—This little port, with depths of 4 to 6 fathoms, muddy bottom, is used by vessels of moderate size; coasters anchor at the head and make fast to piles on the beach. It is sheltered south-westward by a rocky point, on the summit of which is the chapel of St. Pietro, but is visited by heavy Bora squalls from the high land in its rear.

The small town—ancient *Albius*—which is close to the water and rather picturesque, communicates with Spalato, 30 miles distant, by a road which passes Almissa, and follows, generally, the trend of the coast; the town carries on a small trade with the interior.

Water and fresh provisions may be procured, and there are facilities for repairing small craft.

**LIGHTS.**—On the north-western point of St. Pietro peninsula is a square white tower over the centre of a dwelling, 46 feet high, from which is exhibited at an elevation of 51 feet above the sea, a *fixed white* light, visible in clear weather from a distance of 13 miles, when bearing from S. 31° E., through east and north, to N. 31° W.

A *fixed red* light, elevated 20 feet above the sea, visible 2 miles, is shown 16 yards from the molehead within Makarska port. The light may be seen from the north-westward over the low neck of land forming the peninsula of St. Pietro. It is not lighted during the Bora.

Chart.  
2,712 [803].

**Mount Biokovo**, 5,780 feet above the sea, is the highest and most remarkable of the mountains in the neighbourhood of Makarska, and, like the others, the upper portion is whitish and destitute of vegetation. When it is enveloped in fog, which rises in a scattered form, a strong northerly wind may be expected.

Lat. 43° 20' N.  
Long. 16 24 E.

**BRAZZA ISLAND**, separated from Solta island by Spalato passage (see page 201), is one of the richest and most populous of the Dalmatian islands; it is 22 miles in length, in an east and west direction, 7 miles across its broadest part, and, at its western end, nearly 5 miles. The southern side is highest and very mountainous; near the middle, on that side, mount St. Vito rises 2,552 feet above the sea; the slope towards the northern shore is gradual. The hills are well wooded and afford good pasturage; the lower grounds are cultivated and produce wheat, wood, oil, wine, and firewood.

It contains 19 villages and about 16,000 inhabitants, who are very industrious and make good sailors. Bol, the chief village, is close to the sea near the middle of the southern coast.

Cape Planche, the eastern extreme of the island, is low and woody, and is about 3 miles from the mainland.

**Telegraph cables.**—Telegraph cables are laid from Vela Luka cove on the northern coast of Brazza island to Monte Grosso point; from a small cove just west of Pucisce lighthouse to Velika Luka cove, both on the mainland; and from Bol on the southern coast to Chiave, the bay next eastward of Stinja cove, Lesina island; the shore end at Bol is marked by a tower near the south-eastern extreme of the sea wall. Vessels should avoid anchoring near it. The western end of Brazza is also united with Solta by cable.

Lat. 43° 22' N.  
Long. 16 26 E.

**West coast.**—**Port Stipanska**, a small creek under St. Giorgio point, the north-western extreme of Brazza, is the northernmost of the anchorages on this coast which afford good shelter from the Bora; the depth is 11 fathoms, mud, but the space is sufficient for two or three

vessels only. Vessels of any size may safely anchor in north-easterly winds outside the creek, south-westward of the point at the left of its entrance. Chart,  
2,712 [803].  
Var. 7° 40' W.

**Bobovisce cove**,  $1\frac{1}{4}$  miles southward of port Stipanska and beyond a bluff, steep, rocky point covered with wood, affords shelter at its entrance; in a Bora, vessels of light draught anchor inside and make fast to the shore near the village. This anchorage, as well as that of Stipanska, is difficult to reach with easterly winds, and both are exposed to westerly winds.

**Port Milna**, the best of the Brazza ports, is protected from all but northerly and north-westerly winds; it is considered an excellent anchorage, with room for several vessels. The outer anchorage is between Zaglav point and the entrance, in a depth of 14 to 19 fathoms. Small vessels anchor in the middle of the inlet, which is about three-quarters of a mile deep, and at its head is the village. Lat. 43° 26' N.  
Long. 16 25 E.

Small supplies may be procured at the village, and slight repairs made good.

**Lights.**—On Biaka point, the northern entrance point to port Milna, stands a stone turret 21 feet high, from which, at an elevation of 23 feet above the sea, is exhibited a *fixed* light showing *green* when bearing from S. 54° E. to S. 67° E., over Smerduglia islet; *red* elsewhere; it is visible in clear weather from a distance of 2 miles.

A small *fixed* light, visible 2 miles, is exhibited at the entrance of the inner harbour of Milna, showing *green* when bearing from S. 59° E. to S. 77° E., towards the entrance; *white* elsewhere.

**NORTH COAST.**—**St. Giovanni village** is 2 miles from the north-western end of Brazza; there is no port, but about half a mile from the shore, anchorage may be obtained in a depth of 17 and 18 fathoms.

**Light.**—From a post on the south-west angle of the mole-head, at an elevation of 18 feet above the sea, a *fixed red* light is exhibited, visible 3 miles, between the bearings S. 26° E., through south, and S. 82° W.

**Vela Luka cove.**—**Telegraph.**—At Vela Luka cove, three-quarters of a mile westward of St. Pietro, there is a telegraph station, and a cable is laid thence to Monte Grosso point on the mainland.

**Port St. Pietro**, about  $5\frac{1}{4}$  miles from the north-western extreme of Brazza, is the chief of the small ports or coves on the northern coast of Brazza and is protected by a mole. Its position is denoted by a small church on the western point of the port, and by the village which is on an eminence. Half a mile off-shore and fronting the port there is a patch with 3 fathoms water. Lat. 43° 23' N.  
Long. 16 33 E.

**Light.**—From a stone turret on the mole-head at an elevation of 25 feet above the sea, a *fixed green* light is exhibited, visible 3 miles.

**Port Postire**,  $3\frac{1}{2}$  miles eastward of St. Pietro, is quite exposed and unimportant.

**Light.**—From a small masonry tower on the mole-head, at an elevation of 23 feet above the sea, is exhibited a *fixed red* light, visible 3 miles, when bearing from S. 87° W., through south and east, to N. 26° W.

**Port Pucisce**,  $8\frac{1}{2}$  miles eastward of St. Pietro, is a narrow inlet running in about two-thirds of a mile, with a depth of 17 fathoms at the entrance, decreasing to 3 fathoms off the village at its head.

**Light.**—At 42 yards within St. Nicolo point, the western point of entrance to port Pucisce, from the church tower, at an elevation of 40 feet Lat. 43° 21' N.  
Long. 16 44 E.

Chart.  
2,712 [203].  
Var. 7° 35' W.

Lat. 43° 20' N.  
Long. 16 49 E.

above the sea, a *fixed white* light is exhibited, visible in clear weather from a distance of 5 miles.

**Luka and Povie coves**, 4 miles east of Pucisce and the same distance from the eastern extreme of the island, are situated in the same bay. The western arm, in which Luka is situated, is about a mile in length, with deep water in the entrance shoaling to 8 and 9 fathoms near its head; being open to the eastward, it is exposed to winds from that quarter.

Povie cove, in the south-east part of the bay, has depths of 9 to 12 fathoms, extending south-eastward to Povie village. There is anchorage for small vessels, well sheltered from the eastward.

There are many other small coves along the northern coast of Brazza, frequented by boats trading with the mainland.

**Light.**—From a white stone tower, 16 yards within St. Antonio point, the north-eastern point of Povie cove, at an elevation of 24 feet above the sea, a *fixed red* light is exhibited, visible 3 miles.

Lat. 43° 17' N.  
Long. 16 52 E.

**SOUTH COAST of Brazza.**—**Port St. Martino**, at the south-eastern end of Brazza, affords protection for small vessels from the Bora in a depth of about 7 fathoms, mud, on the western side of St. Martino point, the headland which forms the port. Vessels of light draught anchor farther in. The woods on this part of the island are considered to break to a great degree the force of the Bora. St. Rocco point, on which is a church, sufficiently indicates the position of the port; it is 2 miles southward of cape Planche, the eastern extreme of the island, and about half a mile north-eastward of the entrance to port St. Martino.

**Telegraph.**—There is a telegraph station at port St. Martino.

**Lights.**—On St. Martino point, from a stone tower on the south-eastern side of the keeper's dwelling, 13 yards from the shore and elevated 23 feet above the sea, is exhibited a *fixed white* light, visible in clear weather from a distance of 5 miles.

On the head of the mole in port St. Martino, a *fixed red* light is exhibited from an iron standard, at an elevation of 18 feet above the sea, visible 2 miles. Cannot be lighted in strong S.E. winds.

Lat. 43° 15' N.  
Long. 16 39 E.

**Bol.**—This village is about in the middle of the southern coast of Brazza and is the centre of the trade of the whole island, being rich and populous and extending about two-thirds of a mile along the shore. Near the centre of it is a cove and mole, under which small craft find shelter. Vessels of larger size anchor outside opposite the cove in depths of 9 to 11 fathoms, sand, abreast of St. Nicolo church, which stands on a hill at the eastern extreme of the village; care should be taken to avoid the telegraph cable, *see* page 204.

In approaching the anchorage from the westward, a berth should be given to Lunga point, about a mile westward of the village, from which, as well as from the shore eastward of it, a reef projects some distance.

Mount St. Vito, 2,552 feet above the sea, the highest point of the island, is a good distant mark for the anchorage, Bol lying at its foot about 2 miles eastward of its summit.

Water and small supplies of provisions may be procured at Bol.

**Light.**—From a white stone turret at the head of the mole at Bol, elevated 24 feet above the sea, is exhibited a *fixed red* light, visible from a distance of 3 miles.

\*Lat. 43° 18' N.  
Long. 16 26 E.

**Ports Giuseppe,\* Lucice, Gerska, and Oliveto**, near the western extreme, are the only other anchorages worthy of mention on the

southern coast of Brazza; these are available for small craft alone, which frequently await in one of the first two a favourable opportunity for passing through the Spalato passage. In these small ports, vessels generally secure to the shore after anchoring.

Chart,  
2,712 [803].  
Var. 7° 35' W.

**BRAZZA CHANNEL**, a continuation of the Spalato channel, described at page 201, is the passage between Brazza island and the mainland; it is exposed to sudden and violent Bora gales. The current is regular but frequently rapid when the Narenta and Cetina rivers are swollen. Near mid-channel, the depth is from 30 to 42 fathoms and the bottom is almost everywhere mud; along the shore of Brazza, and occasionally near the mainland, it is a mixture of mud and sand.

Lat. 43° 24' N.  
Long. 16° 40' E.

Two rocky shoals, already mentioned, lie in the channel; viz., the 4½ and 5-fathoms patches between Stobrez cove and Spalato, and the 3-fathoms shoal off port St. Pietro, Brazza island. Coasting vessels keep close to the Dalmatian shore and avoid navigating the channel at night.

**THE COAST** of the mainland between Makarska and the mouths of the Narenta river, a distance of about 23 miles, is backed by high land presenting a few bare peaks; mount Susvid, 3,790 feet high and nearly North of the eastern extreme of Lesina island, is the highest and most remarkable of these peaks and is of conical form. A few scattered villages may be seen within the coast and the land appears fertile and well cultivated, but there is no port or good anchorage on this part.

Small craft occasionally anchor in a depth of about 9 fathoms, a cable from the shore, for shelter from a Bora, and, when meeting contrary winds between the eastern part of Lesina island and the mainland, resort to Dervenik cove 3 miles north-east of St. Giorgio point, the eastern extreme of Lesina, or to Zaoztrog bay, 2½ miles east of Dervenik cove. Zaoztrog bay may be known by a small chapel on the eastern point of entrance, and by some houses at its head; the holding ground is good. Zaoztrog bay is also marked by a convent on its northern shore. The small vessels frequenting these bays anchor in the middle and lay out a cable to the shore, besides taking extra security seaward against southerly winds. There is a small mole in the bay.

Chart,  
2,713 [805].

Lat. 43° 8' N.  
Long. 17° 17' E.

**NARENTA CHANNEL** is the eastern continuation of the Curzola channel, and is bounded by the eastern part of Lesina island and the coast of Dalmatia on the north side, and by the Sabbioncello peninsula on the south; it is clear of dangers, with deep water, varying from 32 fathoms in mid-channel in its outer part to 14 or 15 fathoms off the entrance of the Narenta river.

Charts,  
2,712 [803],  
2,713 [805].

It is advisable, when proceeding up this channel, especially with northerly and easterly winds, to keep near the shores of Lesina and the mainland, where a favourable counter current will generally be met, as the Sabbioncello coast is iron-bound and without places of shelter. The waters of the Narenta flow into the eastern part of the channel and cause a rapid westerly current, especially in the rainy season, at which period the water is frequently discoloured as far as the entrance of the channel.

**SABBIONCELLO PENINSULA, North Coast.**—**CAPE GOMENA**, the north-western extreme of the Sabbioncello peninsula, juts out westward between the islands of Lesina and Curzola, which, here, are about 8½ miles apart; it is lower and less steep than the rest of the coast, but the land 3½ miles south-eastward of it rises to a height of 1,315 feet, and 2 miles farther eastward is mount Velika Dclina,

Lat. 43° 3' N.  
Long. 17° 0' E.

Charts,  
2,712 [803],  
2,713 [805].  
[Lat. 43° 3' N.  
Long. 17 0 E.  
Var. 7 20 W.]

2,474 feet above the sea. The northern side of the cape is bordered by a rocky bank extending more than a quarter of a mile off-shore.

From Gomena point eastward, the whole northern shore of the Sabbioncello peninsula forming the southern side of the Narenta channel, is high, wooded, and, with two exceptions, steep-to and affords no shelter. Duba point, on which there is a chapel,  $7\frac{3}{4}$  miles eastward of cape Gomena, is bordered by a shoal. Nearly 4 miles further eastward, about half a mile westward of Trappano, is another shoal with 2-fathoms water, about a quarter of a mile from the shore, and with a depth of 12 fathoms inside it. There are several small coves completely exposed to north-easterly winds, and a few villages, of which the chief, Trappano (where there is a small mole) and Duba, are easily recognised by their church steeples; the inhabitants carry on a small trade in cured fish.

**Telegraph cable.**—A telegraph cable connects cape Gomena with Smerska cove on the southern side of the island of Lesina.

**LIGHTS.**—**Cape Gomena.**—At 23 feet from the extreme of cape Gomena, from a red square masonry tower, 37 feet in height, a *fixed white* light, visible in clear weather from a distance of 9 miles, is exhibited at an elevation of 34 feet above the sea. The light is visible from the bearing N. 4° E., through east and south, to S. 85° W. Not lighted in stormy weather.

Lat. 43° 1' N.  
Long. 17 16 E.  
Chart,  
2,713 [805].

**Trappano.**—A quarter of a mile westward of Trappano church is the little port of that name protected by a small mole or breakwater. From a post on the molehead, at an elevation of 24 feet above the sea, a *fixed* light is exhibited visible in clear weather from a distance of 6 miles, showing *red* when bearing from S. 60° E., through south, to S. 86° W.; *white* elsewhere. Not lighted in bad weather.

Plan, 1,582 [807].

**Briesta bay**, opposite the entrance to Klek bay, is an indentation  $3\frac{1}{2}$  miles in length and about a mile in depth, encumbered with islets, rocks, and shoals, but with deep water between and among them. The little islet of Gojak lies E. by N. half a mile from Rat point, the north-western extreme of the bay, and there is a smaller islet between it and the shore. Blaca point, the south-eastern point, projects north-westward, covering and sheltering from the eastward an anchorage with a depth of from 10 to 12 fathoms; in the extreme corner of the bight thus formed is the village and church of Briesta. All the islets and rocks of the bay are within a line drawn from Blaca point to Gojak islet.

Lat. 42° 55' N.  
Long. 17 31 E.

**LIGHTS.**—**On Blaca point**, from a white stone turret adjoining a dwelling, 42 feet high, at an elevation of 55 feet above the sea, a *fixed white* light is exhibited, visible in clear weather from a distance of 10 miles, when bearing from S. 46° E. (leading 2 cables clear of Gojak islet), through south and west, to N. 68° W.

**Drace.**—From the mole-head of Drace, at the western end of Briesta bay, a *fixed red* light is exhibited, elevated 19 feet above the sea, visible 2 miles, when bearing from S. 15° W., through west, to N. 78° W.; and from N. 12° W., through north and east, to S. 60° E.; obscured elsewhere. Cannot be lighted in S.E. gales.

From Blaca point south-eastward, the remainder of the northern coast of Sabbioncello is included in the description of the Stagno Piccolo channel at page 211.

**NORTHERN SHORE.**—**Gradac** is a small village and fort on the mainland abreast St. Giorgio point, the east extreme of Lesina island, and  $3\frac{1}{4}$  miles south-eastward of Zaoztrog bay, page 207; there is a mole in the bay affording shelter where coasting craft unload.

Chart,  
2,713 [805].  
Lat.  $43^{\circ} 6' N.$   
Long.  $17^{\circ} 20' E.$   
Var.  $7^{\circ} 25' W.$

**Light.**—From an iron standard on the molehead of Gradac, at an elevation of 15 feet above the sea, a *fixed green* light is exhibited, visible at the distance of 3 miles when bearing from N.  $60^{\circ} E.$ , through north and west, to S.  $9^{\circ} E.$

**Port Tolero.**—The western side of the entrance to this small port is the high bluff point of Visnica, the termination of the bold coast on the north; the eastern side of entrance is the low broken shore forming part of the delta of the Narenta, the shallow water from which, reaching almost over to the high land of Visnica, is marked by piles and leaves only a narrow passage into the port, which was 60 yards wide in August 1905.

Plan of port  
Tolero on  
2,713 [805].  
Lat.  $43^{\circ} 2' N.$   
Long.  $17^{\circ} 25' E.$

The passage is about 6 cables in length, passing eastward of a large rock a little within the entrance, and then close along by the western shore, the least water being 2 fathoms. Within is a land-locked basin nearly three-quarters of a mile north and south and  $3\frac{1}{2}$  cables wide, with depths of 6 to 8 fathoms, protected from the southward by the delta of the Narenta, which extends from this to the rocky islet of Ossin  $2\frac{3}{4}$  miles south-eastward.

**Beacon.**—Near the edge of the sands midway between port Tolero and the entrance to the Narenta, is a group of red stakes with a red lattice ball as topmark, marking the edge of the shore flat. From this beacon the lighthouse or the molehead bears S.E. by E.  $\frac{1}{4} E.$  distant one mile.

**NARENTA RIVER**, one of the largest of Dalmatia, rises at the base of the mountains between Bosnia and Herzegovina, and, after receiving the waters of numerous tributaries, enters Dalmatia at the village of Metkovic, 11 miles above the entrance. From thence it traverses a marshy country and discharges itself into the sea between long embankments and moles, nearly 2 miles south-eastward of port Tolero, and one mile north-westward of Ossin islet.

Lat.  $43^{\circ} 1' N.$   
Long.  $17^{\circ} 27' E.$   
Plan on  
1,582 [807].

**Depths.**—Extensive works have been carried out in order to confine the course of the Narenta through the marshy plain between Metkovic and the sea to one channel about 11 miles in length.

Vessels which can cross the bar (13 feet) can ascend the river as far as Metkovic, 11 miles above the entrance, which place is in railway communication with Mostar, the capital of the province of Herzegovina. See depth signals, page 210. Small vessels can proceed as far as the village of Vido near the ruins of the ancient town of Narenta.

**Quays** are established at Opus, about 6 miles from the entrance and again at Norino 2 miles higher, where the river is crossed by a ferry chain and also by a telegraph cable, the position of which is sufficiently guarded by the ferry.

**Narenta** was formerly the capital of Dalmatia and of great influence, exacting tribute from the whole of Dalmatia and from Venice for the right to enter the channel; it was afterwards governed by independent sovereigns and formed a separate duchy. The neighbourhood now is but thinly populated owing to its insalubrity so far as the low lands are concerned, but the great improvements in the river have given an impetus to trade.

Plan on  
1,582 [807].  
Lat. 43° 1' N.  
Long. 17 27 E.  
Var. 7 25 W.

**Beacons.**—North of the entrance to the river, at 3 cables north-westward of the northern molehead, there is a group of red stakes with a triangular topmark which marks the edge of the shore bank; it lies  $6\frac{1}{2}$  cables south-eastward of the beacon with ball-topmark mentioned on page 209.

On the southern side of the entrance to the river there are two conical buoys painted white, marking the north side of the bank extending seaward from the southern mole; the south-west or outer edge of this bank is marked by three white stakes with pyramid-shaped topmarks. This bank is subject to change.

On the northern summit of Galicak hill there is a conspicuous stone cross.

**Moles.—Depths in river.**—The moleheads are distinguished by day as follows:—On the South molehead is a shed surmounted by a cone, point downwards, the whole painted green. On the North molehead is a shed surmounted by a skeleton ball, the whole painted red. The depth of water in the entrance, in mètres, is shown to vessels about to enter in white figures on a blackboard raised 9 feet above the South molehead. Near the inner light-structure on the same mole, the depths of water over the banks in the river are shown from a similar board.

**Lights.**—On the North molehead at the entrance to the Narenta river, a *fixed red* light is exhibited, elevated 13 feet above the sea, and visible in clear weather from a distance of 2 miles.

On the South mole, 2 cables from the end, another *fixed red* light is shown, at an elevation of 26 feet above the sea, visible 4 miles.

On the head of this mole, elevated 15 feet above the sea, a *fixed* light is exhibited visible one mile, showing *red* when bearing from S. 71° E. to S. 59° E.; *green* elsewhere.

**Directions.**—The entrance fairway is just northward of the white buoys and beacons marking the bank on the south side of the channel. The depth is subject to change, but the plan shows  $2\frac{1}{4}$  fathoms; it is not prudent to attempt to enter without local assistance. Depth signals are shown from South molehead.

**Outer anchorage.**—Between the entrance to the Narenta and Ossin islet to the southward, is Narenta anchorage with depths of 7 to 10 fathoms, mud. On the south-eastern side of Ossin islet there is a small sheltered area with 3 and 4 fathoms water, named Blaca bay; the anchorage here is on the western side of the bay, the whole of the centre being occupied by a 6-feet shoal connected with the Planik islets and with the shore on the south-eastern side.

Lat. 43° 1' N.  
Long. 17 34 E.

**Up river.—Lights.**—At Opus Fort, about 6 miles up the river, a small *fixed red* light is exhibited from the east corner of the quay, visible one mile from the bearing S. 59° E., through south and west, to N. 59° W.

A *fixed white* and *red* light, visible one mile, is shown at port Metkovic farther up the river.

**Coal.**—From Metkovic, about 11 miles up the Narenta river, between 30,000 and 40,000 tons of coal is annually exported from the Austrian Government mines. About 100 to 150 tons is usually in stock.

The light on Blaca point, on the Sabbioncello peninsula, described at page 208, is a great assistance at night in approaching the Narenta. Plan, 1,582 [807].  
Var. 7° 20' W.

**THE COAST** between the mouth of the Narenta and the entrance to Klek bay, about  $6\frac{1}{2}$  miles south-east of it, is steep and rocky, backed by high mountainous land, and presents nothing more remarkable than a church and dwellings here and there. Besides Blaca bay, the two little bays of Duba and Soline afford shelter and there is anchorage all along the shore in this part at 5 to 8 cables from it.

**Klek bay** is an inlet  $3\frac{1}{2}$  miles in length and about half a mile in breadth, formed by a high narrow peninsula which follows the direction of the coast north-westward and terminates in Klek point. Lat. 42° 56' N.  
Long. 17 33 E.

The entrance, about 4 cables in width, with a depth of 13 fathoms, is immediately opposite Blaca point lighthouse  $1\frac{1}{2}$  miles distant on the opposite shore of the channel, and is open to the westward. Klek point, the southern point, is bordered by shallow water whilst the northern point is steep-to.

Within the entrance is a small bay on each side and then two points again approach each other from the opposite shores forming an inner entrance. Off the northern inner point lies the Montecuccoli rock, above water and connected with the shore by a flat; and, off the southern inner point, is a similar rock and flat.

**Directions.**—There are no hidden dangers within the bay, which has a depth of 10 to 14 fathoms and is an excellent port for vessels of the deepest draught, but is unfortunately so inconveniently isolated.

No fresh water is obtainable and its well-wooded shores are nearly uninhabited. The nearest watering place is Briesta, on the opposite shore of Sabbioncello.

**Lights.**—From a light-tower above the keeper's dwelling, on the Montecuccoli rock, at an elevation of 26 feet above the sea, is exhibited a *fixed red* light, visible in clear weather from a distance of 2 miles.

From the south angle of landing place at port Neum, 3 miles within the entrance of Klek bay, a *fixed* light is exhibited at an elevation of 20 feet above the sea, visible 2 miles, showing *red* when bearing from S. 32° E., through east, to N. 30° E.; *white* elsewhere.

**Telegraph.**—Neum is a telegraph and postal station.

**STAGNO PICCOLO CHANNEL** is the continuation south-eastward of the Narenta channel and, commencing at the entrance to Klek bay, ends  $10\frac{1}{2}$  miles farther south-eastward in a blind channel. For the first 5 miles it is deep and clear of dangers, with muddy bottom, and vessels of deep draught may anchor safely in any part; but the narrowness of the channel and the frequency of violent Bora gales render its navigation difficult for sailing vessels. Lat. 42° 55' N.  
Long. 17 34 E.

At  $5\frac{1}{2}$  miles from Klek point, Nedilja point, the extreme north-western point of a tongue of land jutting out from the Sabbioncello shore, narrows the channel to about 3 cables, and, from thence, it can only be navigated by small vessels. Here Bjelevica bay on the southern side and Bistrina bay on the northern shore, afford shelter; the former in depths of 6 to 8 fathoms, the latter in 3 to 5 fathoms.

Beyond the entrance to Bistrina bay, the channel becomes very narrow and is almost barred by a rocky shoal, though it again opens out somewhat, before finally terminating some  $2\frac{3}{4}$  miles beyond this point.

**The town** of Stagno Piccolo, almost in ruins, is on the south-western shore about 2 miles from the south-eastern extreme of the channel; it is Lat. 42° 51' N.  
Long. 17 42 E.

Plan, 1,582 [807].  
Var. 7° 20' W.

visited only by vessels of less than 12 feet draught, on account of the rocky shoal just mentioned, and known as the Vranjak shoal, on which is a stone conical beacon standing in about a foot of water, with a depth of 11 feet in the channel between it and the northern shore and 12½ feet in that between it and the village of Hodilje on the southern side.

The southern channel is marked by four conical buoys, painted white.

Stagno Piccolo is only two-thirds of a mile distant by land from Stagno, but when approached by the Great Stagno channel on the opposite side of the Sabbioncello peninsula, the distance between the two places by water is about 87 miles.

The shores of the Stagno Piccolo channel are generally high and wooded, and the creeks and inlets abound with trunks of trees from which the natives gather quantities of oysters.

Chart,  
2,712 [803].  
Var. 7° 30' W.

**LESINA**, the ancient *Pharos*, is one of the largest and most populous of the islands of Dalmatia, from which coast its eastern end is distant only 2¼ miles. The island is 37½ miles in length in a W. by N. ½ N. and E. by S. ½ S. direction; its width for 22 miles from the eastern end averages about 2 miles, the island then widens to 5 miles, the northern coast trending northward, and, from thence, this coast is much broken by bays and inlets and is very irregular as far as the western end. Nearly the whole of the southern side rises abruptly, a chain of mountains at a short distance from the sea extending from the western end more than two-thirds of its length. The highest of these, mount St. Nicolo,\* is about 11 miles from the western end and is 2,053 feet high; on its summit is a chapel.

\*Lat. 43° 9' N.  
Long. 16 36 E.

From mount St. Giorgio, 1,184 feet high and 11 miles from the eastern end, the heights decline gradually in that direction to the extreme. The higher portions of the island present the bare and sterile appearance common in these parts; the lands sloping towards the north are well cultivated and abound in wood and pasture ground.

There are numerous villages, besides the town of Lesina, and, in all, about 18,000 inhabitants, who are considered good sailors and expert fishermen, and carry on a considerable trade in salt fish and sardines, which latter are plentiful on this coast; these, together with wine of good quality, oil, wheat, honey, of which latter a great deal is exported, and firewood, form the chief products. The island has several good anchorages in Bora gales.

\*Lat. 43° 13' N.  
Long. 16 37 E.

**Telegraph cables.**—A telegraph cable extends from Chiave bay,\* the next bay eastward of Stinja cove, to Bol in Brazza island; another from the little inlet between Great and Little Palermo near the western end and on the southern coast of Lesina, passes between Parzanj and Lingua, near the western end of the Spalmadori islets and thence to Smokova cove at the north-eastern end of Lissa. Turicina bay near the eastern end of Lesina is connected by cable with Igrane opposite on the mainland northward of it; and Smerska cove, on the southern coast, is connected with cape Gomena, Sabbioncello.

Lat. 43° 15' N.  
Long. 16 34 E.

**GRECO de LESINA CHANNEL** is the passage between Lesina and Brazza islands and has a varying breadth of about 2 to 6½ miles. There are no hidden dangers except the shoal projecting about 1½ cables from Lunga point, Brazza island; the depth in mid-channel is from 40 to 44 fathoms, the bottom is sand and mud.

This channel is seldom used except by vessels bound to Makarska on the mainland. The shore of Brazza should be kept aboard in a sailing vessel so as to be enabled to bear up for Citta Vecchia bay, or for the Lesina channel, if overtaken by a Bora; shelter from this wind may also be obtained in the channel under Brazza, off Bol village.

**The Current** generally sets westward and is influenced at the most contracted part of the channel by north-westerly and by south-easterly winds; also, by the waters of the Narenta.

Chart,  
2,712 [803].  
Var. 7° 30' W.

**NORTHERN SHORE OF LESINA.**—Cape Pellegrino, the western extreme of Lesina, is the termination of the mountain of that name, which is three-quarters of a mile within the cape and 492 feet high. From the cape, which is steep-to, the northern coast trends eastward 10 miles to the town of Citta Vecchia; it is throughout bold, broken, and cut up into numerous little coves, the land immediately over it rising 1,130 feet above the sea.

Lat. 43° 11' N.  
Long. 16° 22' E.

**CITTA VECCHIA BAY** is the deep inlet between the eastern part of the land just described, and a fertile peninsula with an irregular and bold coast, projecting from the northern side of the island and terminating 7 miles eastward of cape Pellegrino in Kabal point, which is well wooded and 423 feet high. The bay recedes 4 miles and averages about a mile in width, is open to the north-west, but is well sheltered from northerly winds by a deep indentation on its northern shore. The bottom is mud and sand.

Lat. 43° 13' N.  
Long. 16° 31' E.  
Plan of Citta  
Vecchia bay on  
1,612 [804].

The town of Citta Vecchia is on the southern shore of a narrow inlet, half a mile in length, at the head of the bay; it has 3,100 inhabitants and is the most populous on the island, and carries on a great part of the maritime commerce of Lesina. Coasting vessels are built here. Water and provisions may be procured.

The best anchorage for small vessels during the Bora season is in port Tiha, the first or outer indentation on the northern side of the bay, as there is shelter from northerly winds. The anchorage in Citta Vecchia bay has depths of 14 fathoms about three-quarters of a mile westward of the town. Coasters moor in the inlet a little below the town.

**Light.**—From a small stone turret on Fortino point, the southern point of entrance to the shallow harbour of Citta Vecchia, at an elevation of 23 feet above the sea, is exhibited a *fixed green light*, visible in clear weather from a distance of 3 miles.

Lat. 43° 11' N.  
Long. 16° 35' E.

**Telegraph.**—There is a telegraph station at Citta Vecchia.

**PORTS VERBOSKA AND GELSA.**—Immediately eastward of Kabal point, the north-western extreme of Citta Vecchia bay, is port Vlaska, an indentation three-quarters of a mile deep, the eastern point of which is foul; the coast is then irregular, broken, and deeply indented with many small coves and inlets for 8 miles farther eastward to port Verboska, which, with port Gelas, lies within the bay formed between Glavica point on the north and San Antonio point on the south.

Lat. 43° 10' N.  
Long. 16° 42' E.  
Plan of Verboska  
and Gelsa on  
1,612 [804].

**Port Verboska** is protected from northerly winds by a peninsula 85 feet high, on the northern side, projecting eastward, of which the extreme is Glavica point. Vessels anchor in a depth of about 12 fathoms, mud, a short half mile westward of Glavica point, within the bend of the shore. Small vessels proceed farther in, and secure from Bora gales by laying out cables to the north-eastern shore. At the head of the narrow inlet, which takes a north-westerly direction upwards of a mile from Glavica point, is the village of Verboska.

On the northern side of Glavica point is the islet of Zecevo, 92 feet high; San Antonio point is bluff, precipitous, and covered with trees.

**Port Gelsa** is an inlet about 4 cables deep, open to the north-eastward, the entrance being a long half mile southward of Glavica

Plan on  
1,612 [804].  
Var. 7° 30' W.

point. At the head of the port is the village of the same name, and here the inlet turns westward and is protected by two moles, one projecting from the northern, the other from the southern shore, and within them are depths of from 2 to  $3\frac{1}{2}$  fathoms. Small vessels also anchor in about 6 fathoms, in the middle of the inlet but outside the moles. Water may be obtained in abundance at this village.

**Telegraph.**—There are telegraph stations at Verboska and Gelsa.

Lat. 43° 10' N.  
Long. 16 42 E.

**Light.**—On the northern molehead at Gelsa is a small octagonal white tower, from which is exhibited, at an elevation of 21 feet above the sea, a *fixed red* light, visible in clear weather from a distance of 3 miles. During a Bora it is not possible to exhibit the light.

Chart,  
2,712 [803].

**Coast.**—From port Gelsa, the shore trends nearly in a straight line about 22 miles to the eastern extreme of the island. There is no port or place of shelter in all this distance, with the exception of little coves here and there, and the water is deep close in-shore the whole of the distance; there is, however, a shoal with  $4\frac{1}{2}$  fathoms water\* which should be avoided, about 8 cables northward of the western point of Pogarila vela cove, and  $7\frac{3}{4}$  miles westward of St. Giorgio point.

\*Lat. 43° 9' N.  
Long. 17 1 E.

Charts,  
2,712 [803],  
2,713 [805].

**SOUTH COAST OF LESINA.—ST. GIORGIO POINT,** the eastern extreme of Lesina, is low with a chapel on it; it is steep-to on its northern and eastern sides, but there is a depth of 2 fathoms near its southern side.

**Port St. Giorgio,** about 4 cables westward of St. Giorgio point and on the southern side of the island, is formed by a small mole which affords shelter to coasting vessels; near it, on the beach, is a tower. This is the principal and may be said to be the only anchorage towards the eastern end, on the southern side of Lesina; but vessels of any draught may take temporary shelter from a Bora under any part of the shore from port Martinisko, about 4 miles westward of St. Giorgio point, to abreast of cape Gomena, the western extreme of the Sabbioncello peninsula. Vessels should not anchor in a greater depth than 18 fathoms, weeds, nor at much more than 2 cables from the shore.

Lat. 43° 7' N.  
Long. 17 12 E.

**LIGHTS.**—A *fixed white* light is exhibited from a stone tower, situated about 45 yards northward of the chapel on St. Giorgio point, at an elevation of 47 feet above the sea, visible in clear weather from a distance of 9 miles, when bearing from S.  $43^{\circ}$  E., through south and west, to N.  $82^{\circ}$  E. The keeper's dwelling stands near the lighthouse.

From an iron standard on stone base on the molehead of port St. Giorgio, elevated 15 feet above the sea, a *fixed white* light is exhibited, visible at the distance of 3 miles.

**The south coast** of Lesina is fairly steep-to and affords no anchorage except for very small craft in the several coves, which require local knowledge to be available.

The depths are from 6 to 12 fathoms fairly close to the shore, which is backed by high land.

Chart,  
2,712 [803].

**TORCOLA ISLAND** lies  $1\frac{1}{4}$  miles from about the middle of the southern shore of Lesina; it is  $3\frac{1}{2}$  miles in length, a mile in extreme breadth, from 262 feet high at its eastern end to 370 feet at the western end,\* and covered with bushes. The shores are in general steep-to, except at the eastern end, which is bordered by a narrow bank, and a  $2\frac{1}{2}$ -fathoms shoal lies off the eastern point of Oliveto cove at the north-western part of the

\*Lat.  $43^{\circ}$  5' N.  
Long. 16 39 E.

island; a 5-fathoms patch also lies half a mile farther westward. There is no anchorage on the southern side; it is inhabited by a few shepherds during the grazing season. Chart,  
2,712 [803].  
Var. 7° 30' W.

Porto Grande, near the middle of the northern side of the island, extends in a short half mile and has a depth of 5 fathoms at its head, where small vessels find shelter in two creeks. The two entrance points of this port are of whitish colour.

**LIGHT.**—On the east side of the entrance to Porto Grande, a *fixed green* light is exhibited from an iron standard 20 yards within the shore, at an elevation of 21 feet above the sea, visible 3 miles, and showing when bearing from N. 76° W., through south, to S. 74° E., in Torcola channel, and also over the port.

**Torcola channel**, the passage between Lesina and Torcola island, is 1½ miles wide, is quite safe, being deep, and, with the exception of the shoal close off the point of Oliveto cove, is clear of danger. It is difficult and often impossible to work through from the westward, easterly winds greatly accelerating the westerly current; but coasters frequently use this channel in order to keep to windward in the event of a Bora.

Lat. 43° 6' N.  
Long. 16 41 E.

**Lukavei (Bacili) islets.**—About 2¾ miles from the coast of Lesina and rather more than 3 miles westward of Torcola island, are the two small Bacili islets, 19 feet high and surrounded by shallow water, which extend east and west over a space of about 1¼ miles. A rocky 4½-fathoms patch lies one-third of a mile north-west of the western islet with a depth of 9 fathoms between. The flat on which the islets are situated extends 3½ cables north-eastward of the south-eastern islet, with 2 fathoms water, and the whole is steep-to.

Lat. 43° 5' N.  
Long. 16 35 E.

During easterly winds the current sets strongly in the vicinity of these islets.

**PORT LESINA**, on the south-west side of Lesina, is situated about 3½ miles south-east from cape Pellegrino, is the only port of any consequence on the southern side of the island. It is open to the southward, but somewhat sheltered in that direction by the small islet of Galisnik, 59 feet high and with a battery on it, and from the westward and south-westward by the Spalmadori islands.

Plan of Spalmadori channel on 1,612 [804].  
Lat. 43° 10' N.  
Long. 16 26 E.

The anchorage is in a depth of about 20 fathoms, south-westward of the battery on Fabrica point, with Galisnik islet S.E. ½ E. about 2 cables, but steam vessels can anchor in about 12 fathoms, southward of the town. Vessels of light draught anchor in the port off the town. The port is much frequented, being in the route to Planka point and to the various channels, and it is not unusual to see a great number of small craft here when the weather threatens.

The citadel is on a hill of marble which points out the position of the port from all directions; the town of Lesina is bordered by quays, is extremely well built, and is defended by several forts and batteries; it has a population of 2,200.

**Lights.**—On the southern side of Galisnik islet a *fixed green* light is exhibited from a stone tower, at an elevation of 36 feet above the sea, visible in clear weather from a distance of 4 miles.

A small *fixed* lantern light is exhibited from the wharf in port Lesina, elevated 17 feet above the sea, showing *red* seawards and *white* towards the shore, visible one mile.

Plan of Spalmadori channel on 1,612 [804].  
Var. 7° 35' W.

**Directions** for approaching, *see* page 217.

**Breakwaters.**—There are two moles, 20 yards and 114 yards long respectively, for the use of small vessels.

**Supplies.**—Water and provisions may be procured; also timber for the repair of vessels.

**THE SPALMADORI ISLANDS.**—The main body of these islands and rocks lies westward of port Lesina, and they extend over a space  $6\frac{1}{2}$  miles in length east and west, by nearly  $1\frac{1}{2}$  miles in breadth; in height they range from about 100 feet at the eastern end to 315 feet near the western end of Clemente, the centre and by far the largest island of the group; the coast line of the whole is irregular and deeply indented with coves from end to end. The southern sides of the group are precipitous, of barren aspect, and should be given a berth, especially in bad weather, both on account of the outlying dangers and of the rapidity of the current through the narrow passages.

Lat. 43° 10' N.  
Long. 16 19 E.

**Vodnjak islet**, the westernmost of the group is about 4 cables in extent and 148 feet high, with several smaller islets or rocks and shallow water around its northern side.

**Shoal.**—A quarter of a mile W.S.W. nearly from Little Vodnjak, the western islet or rock, which is 49 feet high, and the same distance from the nearest part of Vodnjak, is a shoal with  $2\frac{1}{4}$  fathoms water. This is the western danger of the Spalmadori group and should be carefully avoided when rounding this end of the islands.

Lat. 43° 9' N.  
Long. 16 22 E.

**Port St. Clemente.**—On the southern side, and nearly midway along Clemente island, is the islet of Dobriotok fronting port St. Clemente. The islet is 170 feet high, a cable from the southern horn of the bay, and connected with it by a flat with 4 fathoms water.

The bay is half a mile in length north-west and south-east and nearly a quarter of a mile in breadth, open to the westward, and affords shelter from all but westerly winds in a depth of 14 to 18 fathoms. In approaching port St. Clemente from the westward, Razanj point, the south-western extreme of the island, should be given a wide berth, as shallow water extends a cable southward of it.

Lat. 43° 9' N.  
Long. 16 23 E.

**Stambedar islet**, the southernmost of the Spalmadori islands, is 102 feet high, lies 7 cables south-eastward of Dobriotok islet, and is a short half mile from the nearest point of Clemente island. The southern side of this islet is steep-to, but the Planchetta islets or rocks close to the eastward are surrounded by shallow water, and a rocky  $2\frac{1}{2}$ -fathoms shoal lies  $2\frac{1}{4}$  cables eastward of Planchetta, and banks with  $6\frac{1}{2}$  fathoms lie farther north-eastward.

A vessel from the eastward passing along the coast should avoid these dangers, but may pass close to the southern side of Stambedar.

**Girolamo islet**, the easternmost of the group, with the exception of Pokonjidol, is nearly 3 cables in diameter and 103 feet high, with a shoal extending more than a cable from its northern point. Rather more than a quarter of a mile off its southern side, are two rocky shoals  $1\frac{1}{2}$  cables apart, with 3 fathoms water on the western, and  $4\frac{1}{2}$  fathoms on the eastern shoal; there is deep water between the two shoals, and between them and the islet.

Rather more than  $1\frac{1}{2}$  cables off the eastern side of the islet, is another rocky shoal with 4 fathoms water, and from 13 to 17 fathoms between it and the islet.

Plan of Spalmadori channel on 1,612 [804].  
Var.  $7^{\circ} 35' W.$

**Clearing mark.**—The church of San Marco, at the head of port Lesina, seen about midway between Galisnik islet and the shore eastward of it, bearing about N.  $\frac{1}{2}$  E., leads eastward of the southern dangers, and between Girolamo and the 4-fathoms shoal eastward of it.

**LIGHT.**—**Pokonjidol islet**, about 200 yards in diameter, 36 feet high, and fringed by a narrow bank, lies 6 cables eastward of Girolamo islet and  $2\frac{1}{2}$  cables from the shore of Lesina. On the islet is a lighthouse rising from the keeper's dwelling, 47 feet high, from which is exhibited at an elevation of 67 feet above the sea a *fixed red* light, visible in clear weather from a distance of 10 miles.

Lat.  $43^{\circ} 9' N.$   
Long.  $16^{\circ} 27' E.$

**SPALMADORI CHANNEL** is the approach to port Lesina from the westward. This channel, with depths of 32 to 37 fathoms, lies between the south-western part of Lesina island and the Spalmadori islets. It is much frequented by coasting vessels as it is easy of access and exit with all winds and affords good shelter from the Bora, although heavy squalls are often encountered. The current is strong, and with easterly winds it is difficult to beat up to an anchorage. Westerly winds are often severely felt here.

Lat.  $43^{\circ} 11' N.$   
Long.  $16^{\circ} 21' E.$

There is anchorage for small vessels in the three little bays on the coast of Lesina westward of the town, and, in case of necessity, under the lee of the Spalmadori islands.

**DIRECTIONS.** — **Spalmadori channel and port Lesina.**—There are only two good channels leading to port Lesina; the western, between cape Pellegrino and the westernmost of the Spalmadori islands; and, the south-eastern, between St. Andrea point, Lesina, and Girolamo islet.

**Spalmadori, the western channel**, is a mile wide nearly all the way to the port, quite safe, and preferable to the other when the wind admits of its being taken. When approaching from the north-westward, cape Pellegrino may be seen from a considerable distance, resembling a dark hill covered with trees; shortly afterwards, the Spalmadori islets will be distinguished opening out to the right of the cape; and, when abreast of the channel, St. Andrea point battery, St. Francesco convent, and Veneranda battery on Fabrica point will be visible before the town is sighted. Cape Pellegrino and the southern coast of Lesina may be kept aboard if desirable.

**The south-eastern channel**, between Girolamo, the western islet, and Pokonjidol islet, though narrow, is convenient with easterly winds. It should not be attempted by a sailing vessel without a good leading wind. As soon as fort St. Nicolo (in ruins) is seen, 790 feet above the sea and about a mile north-eastward of the entrance, it should be steered for, and the other forts and objects of the town will in due course come in sight.

Lat.  $43^{\circ} 9' N.$   
Long.  $16^{\circ} 27' E.$

Vessels of deep draught should pass about  $1\frac{1}{2}$  cables westward of Pokonjidol islet, with fort St. Nicolo bearing N. by E. until the northern extreme of Gojca islet is on with the northern extreme of Marinkovac, the island next westward of Girolamo; a vessel is then northward of the 4-fathoms shoal eastward of Girolamo and may steer westward for the anchorage, giving the western side of Galisnik a berth of at least one cable.

Plan on  
1,612 [804].  
Var 7° 35' W.

Chart,  
2,712 [803].

\*Lat. 43° 2' N.  
Long. 16 7 E.

When working up from the southward, the southern sides of the Spalmadori islands should not be too closely approached on account of the current setting between them, and also to avoid the Planchetta shoals.

**LISSA**, the largest of the outlying islands, is  $9\frac{1}{2}$  miles in length, east and west, and 4 miles in breadth. It lies south-westward of the Spalmadori islands and is separated from them by the Lissa channel, very deep and 6 miles wide between the two nearest points; viz., Stoncica point, Lissa, and Vodnjak islet of the Spalmadori group. It presents the appearance, from all directions, of an irregular hilly mass covered with trees; the highest peak, mount Hum,\* 1,920 feet above the sea, is bare topped and surmounted by a small tower, and when seen from the south-eastward, eastward, or north-westward presents two distinct hill tops on the lower of which is a chapel. The southern side of the island rises abruptly and is higher than the opposite side, towards which the land descends in gradual well-cultivated slopes, on which are several towers. The shores are high and steep-to, except in the immediate vicinity of the south-eastern shore. See view A. on chart No. 2,712.

**Population.**—There are about 10,000 inhabitants, who chiefly occupy the two principal towns, Lissa, at port St. Giorgio in the north-east, and Comisa, at the western end of the island; many of them are sailors and fishermen.

**Trade.**—Oil, wine, honey, and wheat, in small quantities, form the main produce, and considerable exports of sardines and of salt fish take place. The British had possession of this island from 1812 to 1815.

**Telegraph cable.**—A telegraph cable is laid from Smokova cove at the north eastern end of Lissa island, to the little inlet between Great and Little Palermo near the western end of Lesina, passing eastward of Vodnjak and between Parsanj and Lingua islets of the Spalmadori group.

**NORTH COAST.**—The coast between port St. Giorgio and Stoncica point, the north-eastern extreme of Lissa,  $2\frac{1}{4}$  miles eastward of Hoste island, is bold and steep-to, with several coves, Stoncica cove, next westward of the point, being 7 cables deep. Stoncica point slopes gradually seaward and has on it a conspicuous white lighthouse. The coast from port St. Giorgio to the north-western point of Lissa, a distance of 7 miles, is also bold and steep-to with one or two small coves and an islet or rock close to the shore about midway; it is backed by high land which, near the western end and  $1\frac{1}{4}$  miles from the northern coast, is 1,686 feet high.

Lat. 43° 4' N.  
Long. 16 15 E.

**LIGHT.**—**Stoncica point.**—From the lighthouse, 92 feet high, on Stoncica point is exhibited at an elevation of 126 feet above the sea, a *fixed white* light varied by a *flash* every *minute*, visible in clear weather from a distance of 17 miles when bearing from S. 62° E., through south and west, to N. 5° E.; this latter bearing cuts some distance inside Greben islet and some of the shoals on the eastern coast of Lissa. See sketch of lighthouse on chart No. 2,712.

**Signal station.**—About 80 yards south-westward of the lighthouse is the signal station, a building painted with black and whitestripes, having on it a black mast with a yard. The signals used are those of the International Code, and the station is connected with the telegraph system of the continent.

**Weather signals.**—The usual weather signals are made at this station, and the weather forecast communicated by the meteorological department is signalled *gratis* to vessels under way applying for it.

**PORT ST. GIORGIO**, on the north-eastern side of Lissa, is surrounded by hills; it is a mile in length, about  $3\frac{1}{4}$  cables wide at the entrance between Hoste island and the shore south-eastward of it, 4 cables wide half way in, and 6 cables at the head of the port, with depths of from 25 fathoms in the outer part to 10 fathoms close in, having thus sufficient space and depth for all classes of vessels.

Plan of port  
St. Giorgio on  
1,612 [804].  
Lat. 43° 4' N.  
Long. 16 12 E.  
Var. 7 45 W.

**Islets in the approach.—Vitelli and Vacca rocks.**—The north-eastern and larger of the two Vitelli rocks, 10 feet high, bears about N.W. by N., distant  $7\frac{1}{2}$  cables from Hoste island lighthouse, and a reef extends half a cable southward of it. At  $1\frac{1}{4}$  cables south-westward of this rock is the smaller Vitelli, 3 feet high; there is a depth of 10 to 13 fathoms between them. A sunken rock with 3 fathoms lies about half a cable S.W. by S. of the smaller rock; between this danger and the nearest point of land is a clear channel a quarter of a mile wide, with depths of from  $6\frac{1}{2}$  to 15 fathoms.

Vacca rock or islet is 9 feet in height, and situated at a quarter of a mile from the coast on the eastern side of the entrance to port St. Giorgio, and about East 6 cables from Hoste lighthouse; it is bordered by shallow water, except on the north-western side, and there is a depth of 24 fathoms between it and the shore.

**Hoste island**, on the west side of the entrance to port St. Giorgio, is 2 cables in length, 69 feet high, bordered at each end by a bank, and has a lighthouse on its eastern end; it is separated from the western point of entrance by a passage a cable wide with 6 fathoms water in mid-channel. This island acts as a breakwater in northerly gales.

Lat. 43° 4' N.  
Long. 16 12 E.

The rocks and island just described present no difficulties whatever to navigation, except in thickish weather, when they are not easily made out; it is nevertheless advisable not to pass too close to them without a commanding breeze, as the current generally sets towards them.

**LIGHTS.**—From a white stone octagonal tower, adjoining dwelling, 37 feet high, 87 yards within the east end of Hoste island, a *fixed red* light is exhibited at an elevation of 72 feet above the sea, visible in clear weather from a distance of 8 miles.

At the head of San Girolamo pier, at the inner end of port St. Giorgio, a *fixed red* lantern light, elevated 18 feet above the sea, and visible 2 miles, is exhibited from a lamp post. Cannot be lighted in N.E. gales.

**Anchorage.**—Vessels of deep draught anchor in about 20 fathoms, sand and gravel, a little inside Schmidt battery, on the eastern side of the entrance, and at an equal distance from the two shores; or, farther in, abreast of San Giralomo on the western shore, on which is a chapel and the arsenal, in about 14 fathoms, mud.

Vessels of light draught moor in the south-western angle of the port close to the town of Lissa.

It is sheltered in every direction except from the north-eastward, and Hoste island at the entrance breaks the sea considerably, though during a Bora much sea sets in but the holding ground is good. Moor with open hawse to the N.E. There are, however, several sets of moorings in the port which are generally placed at the disposal of foreign vessels of war calling here. A southerly gale at times comes on with but little warning.

**Directions.**—On arriving off port St. Giorgio, a chapel will be seen on an eminence at the head of the port, the fortifications on the hills near the entrance, of which the highest, Fort Wellington (584 feet), is on the port hand, and, on a near approach, Hoste island lighthouse and the outlying rocks will be distinguished, and then the white houses of Lissa.

Plan of port  
St. Giorgio on  
1,612 [804].  
Var. 7° 45' W.

If they can be seen, the higher of two towers on the starboard hand in line with the chapel on mount Hum, leads towards the shore between the Vacca and Vitelli rocks. Access is easy to a steam vessel.

The entrance to port St. Giorgio is difficult for a sailing vessel with south-easterly winds, as heavy squalls often render it impossible to carry sufficient sail. When making for this port from the eastward, it is advisable to keep at a distance from the high lands in order to avoid the strong sudden gusts which descend from them.

**The town of Lissa** has about 4,400 inhabitants.

**Coal and Supplies.**—This is an Austrian government coaling station where about 700 tons of Welsh coal is kept in stock, but this coal is only supplied to foreign vessels in cases of necessity. A small supply of Bosnian coal may, however, be obtained at about 16s. per ton. Water is very scarce, and in the summer season is sometimes conveyed from Comisa. Provisions may be obtained; also the means of repairing vessels.

**Telegraph.**—There is a telegraph station here.

**Port Carober**, situated close westward of port St. Giorgio, is convenient for small craft when unable to reach that port; the anchorage is off a cove on the southern side, about one-third from the entrance towards the head of the bay. Between this cove and the entrance, the bottom is rocky and easterly winds are felt in their full force.

Chart,  
2,712 [803].  
Lat. 43° 2' N.  
Long. 16° 5' E.

**LISSA, West coast.—COMISA BAY**, at the western end of Lissa, occupies a space of about  $1\frac{1}{2}$  miles between Magnaremi point on the north, and Stupiski point on the south, and recedes a long mile eastward; it is sheltered from all easterly winds by the high land round it, and is consequently a place of refuge from the Bora and from south-easterly gales, but westerly and south-westerly winds send in a heavy sea, though it is in some degree protected from the latter direction by Busi island.

The town, with 4,700 inhabitants, is in the north-eastern corner of the bay and the anchorage is off it, but the water is deep and a vessel must go tolerably close in; the bottom is mud. Coasters moor in the cove protected by a mole. There is also anchorage half a mile southward of the mole, but farther on in that direction the bottom is rocky.

**Water** may be procured near the town from the fountain which occasionally supplies the inhabitants of Lissa.

**Telegraph.**—There is a telegraph station at Comisa. It is proposed to establish a wireless station here.

**Light.**—A small *fixed red* light, elevated 19 feet above the sea, visible 3 miles, is exhibited from the head of the breakwater at the town of Comisa; it cannot be lighted in south-westerly gales.

**Directions.**—Mount Hum near the south-western extreme of Lissa, and Busi island off Stupiski point, its south-western point, are good marks for this anchorage; see view on chart No. 2,712. The two Barjaki islets, 19 feet high, close to the north-western point of Lissa, may be rounded at a prudent distance. N.W.  $\frac{1}{2}$  N., distant  $1\frac{1}{2}$  miles nearly from the inner and largest islet, is the Seket bank, with  $5\frac{1}{2}$ -fathoms; and, between it and the islet, about three-quarters of a mile from the latter, is the Ploca bank, with 5 fathoms. Both points of Comisa bay are steep-to, but the land at Stupiski point slopes gradually towards the sea and is covered with pine trees; and, near the shore on its western side, 2 cables northward of the

point, is a sunken rock. Working up under the land, a vessel should be prepared for heavy squalls.

Chart,  
2,712 (803).  
Var. 7° 50' W.

Comisa bay and port St. Giorgio, being in the route of vessels traversing the Adriatic and westward of all the channels between the islands off this part of the coast of Dalmatia, are very important to the navigation of this sea.

**SOUTH COAST.—Port Manego.**—The coast between Stupiski, the south-western point of Lissa, and Ravnik islet at the south-eastern point, is rocky and inaccessible. Temporary shelter from the Bora may be sought under it, but the anchor must be dropped very close to the shore. Ravnik islet is 131 feet high and about half a mile in length; between it and the shore of Lissa, is the small anchorage of port Manego which has a depth of 12 fathoms. It is exposed to northerly or southerly winds, and those from the south-eastward send in a heavy sea, but the holding ground is good. The best berth is north-westward of the centre of the islet, and the best passage to it is from the south-westward.

Lat. 43° 1' N.  
Long. 16 13 E.

**Dangers.**—The coast between Ravnik islet and the north-eastern end of Lissa is bordered by a chain of islets, rocks, and shoals to the distance of about a mile, and should be avoided by a stranger. A rocky shoal with 5½ fathoms water lies with the centre of Ravnik islet bearing W. ¾ N., and Stončica point lighthouse N.W. ¼ W., distant 5¼ miles.

Lat. 43° 1' N.  
Long. 16 21 E.

**Green Grotto of Ravnik.**—This grotto is situated on the south-west side of Ravnik islet, off the south-east point of Lissa, and its entrance can be reached by two passages, of which the south-westerly is 23 feet wide with 6 feet water, and the other 39 feet wide with a depth of 16 feet; the entrances are respectively 11 feet and 24 feet above the sea level. The grotto is about 148 feet long, 65 feet broad, with a depth of 6 to 13 feet; the highest part of the roof is 39 feet above the sea.

**BUSI ISLAND** rises abruptly about 2½ miles south-westward of Lissa; it is 2½ miles in length north and south, about a mile in breadth, hilly, and the highest part, towards the southern end and surmounted by the ruins of a castle,\* is 627 feet above the sea. The shores are slightly irregular, the western side is straight, with several small coves, and the water everywhere deep; a sunken rock lies close to the north-eastern point, and, though a rock above water close to the shore may be seen here and there, there are no outlying dangers. The island is inhabited.

\*Lat. 42° 58' N.  
Long. 16 0 E.

The channel between Busi and Lissa islands is deep and clear of danger, but Stupiski point should be avoided as the westerly current sweeps suddenly round it and, in light winds, a sailing vessel might be set towards the coast of Lissa. See view C. on chart.

**Blue Grotto of Busi.**—This grotto is situated under the tongue of land enclosed by the Val Saladinac and the Val Balun, which is conical in shape, is wholly bare, and readily distinguished on account of its white colour. The grotto is practicable for boats when the sea is smooth.

**ST. ANDREA ISLET**, about 12 miles westward from Lissa, has no bay or inlets affording refuge, and the numerous fishing-boats which frequent it are obliged to seek shelter under its lee according to the varying winds. This islet is 2 miles in length east and west, about three-quarters of a mile in breadth and 1,020 feet high, covered with wood, and with the ruins of a castle on it. A sunken rock lies close to its south-western point; elsewhere, the water is deep all around it; see view B on chart.

Lat. 43° 1' N.  
Long. 15 45 E.

Nearly half a mile westward of St. Andrea is Kamik islet or rock, which has deep water round it; midway between the two, the water is

Chart  
2 712 [803].  
Var. 8' 0' W.

deep but the passage should not be unnecessarily taken as the current through is irregular.

Lat. 43° 5' N.  
Long. 15 28 E.

At  $1\frac{3}{4}$  miles from St. Andrea islet, and S.E. by S. from its north-eastern extreme, is Brusnik islet, 39 feet high, with two small rocks above water close to it on its south-eastern side. The soundings midway between Brusnik and St. Andrea are from 44 to 59 fathoms.

The currents in the vicinity of St. Andrea and its islets are irregular and cause strong eddies, especially in winter, and the depth is too great for anchoring. The islets, therefore, should be avoided, especially in sailing vessels with light winds.

**POMO ISLET** lies west-north-westward from the summit of St. Andrea, is about  $12\frac{1}{2}$  miles from the nearest part of that islet; being in the centre of the Adriatic, it is an excellent point of departure for vessels bound from the Italian coast to the vicinity of Planka point or to the channels leading to Zara and Spalato; also, for those navigating this sea at a distance from its western shore. It is a barren, inaccessible rock, 314 feet in height, of reddish hue, and, at a distance, at times resembles a vessel under sail. The soundings in the immediate vicinity of Pomo islet are from 40 to 50 fathoms; *see view on chart*.

Lat. 43° 6' N.  
Long. 15 26 E.

**Pomo rock**, at  $1\frac{1}{4}$  miles N.W. by W. from Pumo islet, is a rocky shoal with  $3\frac{1}{2}$  fathoms water. The soundings round this danger are from 30 to 40 fathoms; and, three-quarters of a mile southward of it, about 100 fathoms.

---

General chart, 1,440 [789].

## CHAPTER VIII.

COAST OF DALMATIA FROM CAPE GOMENA TO THE GULF  
OF CATTARO, AND ADJACENT ISLANDS.

Between cape Gomena, the north-western extreme of the Sabbioncello peninsula and the entrance of the gulf of Cattaro, is a distance of nearly 80 miles. The shore is backed at a short distance by mountainous land with but little intervening space of cultivated ground. Oil, and wine which is considered the best in Dalmatia, are the chief products. The occupation of the inhabitants, generally, is maritime commerce.

Curzola, Meleda, and Lagosta are the three principal adjacent islands; the others are either thinly peopled or uninhabited. The bays formed by them contain abundance of fish, especially sardines and mackerel, but the shores being destitute of fresh water they are seldom visited.

**SABBIONCELLO PENINSULA.**—This singular peninsula, whose northern and eastern coasts were described in the preceding chapter, leaves the coast of Dalmatia at an acute angle in a north-westerly direction and is about 26 miles in length, with an average breadth of 3 miles. Mount Vipera\*, its highest point, rises in a conspicuous hummock  $7\frac{1}{2}$  miles from cape Gomena, its north-western extreme, and attains a height of 3,150 feet above the sea; it may be considered the commencement of two chains of mountains, the base of the northern chain forming the southern side of the Narenta and Stagno and Piccolo channels; whilst the base of the southern range is washed by the waters of the Sabbioncello and Meleda channels. Uniting near the middle of the peninsula they are followed by the Giuliana valley, a sudden and remarkable depression in the land, visible from a great distance seaward, which, owing to the violence of the Bora, has a desolate, dry, burnt appearance. South-eastward of the valley, the land again rises and mount Carovic, about  $4\frac{1}{2}$  miles beyond the village of Giuliana, is 2,070 feet high.

Charts,  
2,712 [803].  
2,713 [805].

\*Lat.  $43^{\circ} 0' N.$   
Long.  $17^{\circ} 9' E.$

**CURZOLA CHANNEL** includes the space between the northern side of Curzola, and the southern sides of Lesina island and western extreme of the Sabbioncello peninsula. Although of considerable breadth, it was not formerly much used, as it did not lead to any point of commercial activity on the Dalmatian coast, but the now considerable importance of the Narenta as a means of communication with the interior has probably brought this channel into more common use.

Chart  
2,712 [803].  
Lat.  $43^{\circ} 2' N.$   
Long.  $16^{\circ} 40' E.$   
Var.  $7^{\circ} 30' W.$

Coasting vessels ordinarily hug the Lesina shore, passing northward of Torcola, especially when anticipating contrary winds, to be in a position to anchor, if necessary, in Porto Grande of that island. The general depth of this channel is from 35 to 40 fathoms.

**Planchetta islet**, situated about 4 miles off the north side of Curzola island, is about 4 cables in length, narrow, 43 feet high, and bordered by a narrow bank with a reef extending from either end, the

Lat.  $43^{\circ} 2' N.$   
Long.  $16^{\circ} 49' E.$

Chart.  
2,712 [803].  
Var. 7° 30' W.

south-eastern extreme of which reef breaks. When seen from the north-west or south-east, it has the appearance of two islets. It should not be approached within a prudent distance.

**LIGHT.**—On the north-western extreme of Planchetta islet, a *fixed red* light, visible in clear weather from a distance of 8 miles, is exhibited from a turret adjoining dwelling, 82 feet high, at an elevation of 111 feet above the sea.

Plan, 1,611 [806].  
Lat. 42° 59' N.  
Long. 17° 3' E.

**SABBIONCELLO CHANNEL.**—The eastern portion of the Curzola channel unites with the Sabbioncello channel, which lies between the Sabbioncello peninsula and the northern coast of the eastern end of Curzola. It is frequented by small vessels trading to the coast of Dalmatia and affords good anchorage throughout for vessels of any size, about half a mile from the coast, in depths of 18 to 24 fathoms, sand, care being taken to avoid the telegraph cable (page 225). In navigating this channel, the chart and eye must be the guides. There is often a strong westerly current.

Chart.  
2,712 [803].  
Lat. 43° 1' N.  
Long. 17° 2' E.

**Port Luka** lies at the western end of the Sabbioncello peninsula, north side of approach to Sabbioncello channel, between cape Gomena and Ossit point; the best sheltered part is in a cove at the north-eastern angle, where small vessels anchor in a depth of 6 or 7 fathoms and secure to the shore. Shallow water extends  $3\frac{1}{2}$  cables from Bila point, on the southern side of entrance to the port; and a 4-fathoms rocky shoal lies in the fairway about 4 cables from the shore on the northern side of entrance. With contrary or light winds, vessels unable to stem the westerly current in the Sabbioncello channel find this a convenient temporary anchorage.

Plan, 1,611 [806].  
Lat. 42° 59' N.  
Long. 17° 6' E.

**NORTHERN SHORE.**—**Rosario road**, situated about a mile within the west entrance of the Sabbioncello channel, is a most eligible anchorage, as there are none on the northern coast of Curzola. A vessel may anchor in a depth of about 11 fathoms, mud; and small craft farther in, on a weedy bottom, where they make fast to the shore, which is bordered by a narrow bank.

There is a copious spring of water near the monastery of Rosario or Viganj, to which the inhabitants of Curzola have recourse in times of drought.

**Kuciste road.**—This anchorage is about  $1\frac{1}{2}$  miles from Rosario road, in the eastern part of the bend of the shore and about half a mile eastward of Kuciste chapel; here also are means of securing a vessel to the shore. Kuciste is a telegraph station. Beyond Kuciste, about a mile westward of Orebic, is a similar anchorage, marked by some houses overlooked by a Franciscan monastery on the eastern side.

**Orebic.**—Vessels may also anchor off Orebic, a village of some importance near the eastern entrance of the Sabbioncello channel, but shoal water extends too far off to allow them to make fast to the shore, hence the existence of a mole, which extends a cable south-westward, and off which, at about one cable, is a mooring buoy in 5 fathoms; a second mooring buoy lies closer in, in  $2\frac{3}{4}$  fathoms.

Orebic is a telegraph station; its inhabitants, numbering about 600, are chiefly seafaring men.

Lat. 42° 58' N.  
Long. 17° 11' E.

**Light.**—A *fixed red* light, elevated 18 feet above the sea, visible in clear weather from a distance of 6 miles, is exhibited from an iron standard on the molehead at Orebic.

**Telegraph cable.**—Between Kuciste and Orebic, at  $5\frac{1}{2}$  cables eastward of Zamostje point, the telegraph cable joining the Sabbioncello peninsula with the town of Curzola, leaves the shore, the position at both ends being marked by small turrets.

**Terstenik bay.**—This bay, about  $1\frac{1}{2}$  miles eastward of Orebic mole, is  $2\frac{1}{4}$  miles wide, and is open to the southward. The western half of the bay is shallow, the 5-fathoms contour being 4 cables from the shore.

From Terstenik bay, at the eastern entrance to the Sabbioncello channel, the shore trends south-eastward to Dingac islet at the entrance to Giuliana bay, a distance of about 8 miles. With the exception of one or two shoal spots close inshore, the water is deep throughout.

**Giuliana bay.—Port Terstenik.\***—The centre of this bay is about 9 miles south-eastward of Terstenik bay, and about the same distance eastward of the eastern extreme of Curzola island. The bay is  $3\frac{1}{2}$  miles wide; close to the shore at its north-western point is Dingac islet, and off Provizda, its south-eastern point, is Alessandria islet, the bay falling back  $1\frac{1}{2}$  miles with deep water throughout, except one sunken rock about 2 cables from the outer of two islets off Vucine cove in the south-eastern part of the bay. This bay with that on the opposite side of Sabbioncello here contracts the width of the peninsula to  $1\frac{1}{3}$  miles and with the exception of the isthmus between Stagno and Stagno Piccolo is its narrowest part, the high land on the northern side falling suddenly and forming the conspicuous valley before alluded to and known as the Giuliana valley.

In the north-eastern corner of Giuliana bay is port Terstenik, a small cove resorted to by coasters in the summer season, the only time when it can be considered safe; these anchor at the entrance in 16 fathoms, and lay out cables to the shores eastward and westward, against the violent gusts of the Bora descending from the Giuliana valley. Here they are partially protected from the eastward by Zaglavak point, a small rocky peninsula, and are well sheltered from westerly winds; those however from the southward send in a considerable sea. Near a projecting point in the middle of the bay is a small church, westward of which is the ordinary anchorage abreast of some stone houses on the beach. There are two mooring buoys off the molehead.

**Telegraph.**—There is a telegraph office at the village of Terstenik open during certain hours of the day.

**Light.**—From the end of the breakwater at the head of port Terstenik in Giuliana bay, elevated 16 feet above the sea, is exhibited a *fixed red* light, visible in clear weather from a distance of 4 miles. This light must be left to port by vessels entering.

**SOUTHERN SHORE.—Port Racisce,** on the southern side of the west entrance to the Sabbioncello channel, is a small cove open to the northward, with depths of 6 to 12 fathoms, mud, in the centre; the small vessels which visit the port secure to the shore. The town of Racisce is built round the head of the cove; it has 850 inhabitants.

**Light.**—From the molehead at Racisce a *fixed red* light elevated 17 feet above the sea, is exhibited, visible from a distance of 2 miles.

**Telegraph.**—There is a telegraph station at port Racisce.

**Kneza bay.**—Rather more than  $1\frac{1}{2}$  miles eastward of port Racisce, and just within the south side of the entrance to Sabbioncello channel,

\* This must not be confounded with Terstenik bay, north-west of it, and above described.

General chart, 1,440 [789].

Plan,  
1,611 [806].  
Var. 7° 30' W.

lies Kneza Grande islet off a point of the same name projecting eastward, and together covering this small bay from westerly and northerly winds; small craft anchor in a depth of 3 to 5 fathoms, muddy bottom; there is two fathoms water between the islet and the point. The islet should not be too closely approached and between it and St. Giovanni point on the mainland is the narrowest part of the Sabbioncello channel which is here only about half a mile wide.

Lat. 42° 59' N.  
Long. 17 3 E.

**Light.**—A *fixed white* light (unwatched), elevated 44 feet above the sea, is exhibited from an iron tower, 25 feet high, on the north-east side of Kneza Grande islet, visible in clear weather from a distance of 8 miles.

**Beacon.**—At 2½ miles eastward of Kneza bay, and a cable from the eastern point of Verbovica cove, is Verbovica shoal with 2 feet water; it is marked by a beacon 15 feet high.

Lat. 42° 57' N.  
Long. 17 8 E.

**Port Curzola and town.**—At 3¾ miles eastward of Kneza islet is the town of Curzola standing on a small peninsula and defended by a fort in the rear. It is the chief place of export for the produce of the island and contains about 2,100 inhabitants. Port Curzola, the small bay on the western side of the town affords accommodation for coasters, but they are exposed to northerly and westerly winds, and in the Bora season there is but little security. Two mooring buoys lie in the centre of the bay.

At the inner end of the new mole at Curzola is a flagstaff, which takes in signals from Sestrice; *see* page 227.

**Telegraph cables.**—Curzola communicates with Sabbioncello peninsula by a cable crossing the Sabbioncello channel from the north-eastern point of the town; both shore ends are marked by beacons or small turrets.

Curzola is also connected with Lagosta by submarine cable, laid between Stiniva cove on the south shore of Curzola to St. Michele in Lagosta. Anchorage is prohibited on or near the line joining these places. The points on the shore are each marked by a white stone pyramid.

**Lights.**—A *fixed red* light, elevated 20 feet above the sea and visible in clear weather from a distance of 3 miles, is exhibited from the molehead at Curzola; it may be seen nearly the whole length of the channel westward and eastward.

A *fixed green* light, visible 2 miles, is shown from the angle of the Health office.

**Port Pedocchio,** on the eastern side and southward of the town of Curzola, is an inlet about 4 cables deep with 9 fathoms water in the middle, suitable for small vessels and sheltered from all winds. There is a mooring buoy outside the western entrance point.

**Port Badia.**—Fronting the north-eastern shore of Curzola island, and encumbering the eastern entrance to Sabbioncello channel, there is a cluster of islets, rocks, and shoals; of these Badia islet, the largest, with Planjak, Kamenjak, and Petrara, three other islets on the south, form with the coast of Curzola the well-sheltered anchorage of port Badia, also known as the Jezuviza channel, which, though narrow, is nearly a mile in length, with a depth of from 7 to 12 fathoms.

Badia islet is connected with Curzola by a ridge over which nearly 3 fathoms water may be carried into the port. Between Badia and Planjak there is only one fathom water, and between Planjak and Kamenjak the depth is 2 fathoms, but with a rock above water on a shoal occupying half the space in mid-channel.

**Beacons.**—Between Badia and Planjak, a cylindrical beacon with iron rod and skeleton ball on a square base of masonry 3 feet above the sea, and

erected in 4 feet water, marks the Badia rock; a similar beacon in 5 feet marks the Planjak rock; and, in order to indicate that there is no passage between Badia and Planjak islets, a third beacon is erected between the other two. Off the northern side of Badia island and West  $2\frac{1}{4}$  cables from Lucnjak islet is a shoal marked by a beacon in masonry,\* and south-eastward nearly two cables from Rogacic islet off the eastern end of Badia is a shoal with only 6 feet water.

Plan,  
1,611 [806].  
Var.  $7^{\circ} 30'$  W.

\*Lat.  $42^{\circ} 58'$  N.  
Long.  $17^{\circ} 10'$  E.

**Directions for port Badia.**—In approaching port Badia from the northward, Kriz shoal with 2 fathoms water about  $1\frac{1}{2}$  cables off the western point of entrance, should be avoided by keeping either shore on board. This entrance is only available for vessels under 15 feet draught.

In entering from the southward, a vessel passing inside of Sutvara island must be careful to avoid the shoal northward of Gudbovac islet marked by a beacon, consisting of an iron staff and two open discs placed crosswise, in one fathom water. Badia convent open of Planjak island, bearing N.  $46^{\circ}$  W., leads in mid-channel through this approach to the southern entrance; see view A on plan No. 1,611.

Thence the channel is between Planjak and Kamenjak islets on the one side and Petrara islet on the other, but Krastovica reef nearly in the fairway and occupying more than half the channel should be avoided by keeping Sestrice lighthouse in line with the north-west point of Gojak islet, bearing N.  $60^{\circ}$  E., which leads midway between Planjak islet and Krastovica reef, in about 4 fathoms; thence between Kamenjak and Petrara, hauling to the northward round the former for the anchorage.

**Islets and rocks.**—There are several islets, eastward of those forming port Badia, lying in the eastern entrance of the Sabbioncello channel; the principal are, Sutvara 118 feet high and woody, Bisaza 39 feet high, Maizan also woody and 102 feet high, Gojak 46 feet high, and the two Sestrice islets; but, for their relative positions, and the rocks and dangers around them, the seaman is referred to the plan. This end of the Sabbioncello channel is marked at night on the southern side by the *white* light on the north-western Sestrice islet and by the *red* light on Curzola mole; and on the northern side by the *red* light on Orebic mole. See view on plan No. 1,611.

Cape Speo, the east extreme of Curzola and the southern point of the east entrance to Sabbioncello channel, is referred to on page 231.

**LIGHT.**—On the larger or north-western Sestrice islet is a white square lighthouse with dwelling attached, 40 feet high, from which is exhibited at an elevation of 58 feet above the sea a *fixed white* light, visible in clear weather from a distance of 11 miles.

Lat.  $42^{\circ} 58'$  N.  
Long.  $17^{\circ} 13'$  E.

Close to the lighthouse is a flagstaff with which vessels can communicate by the International Code of signals.

**Directions for the Sabbioncello channel.**—When making for the passage from the westward, mount Vipera on Sabbioncello peninsula is a good mark. The approach between Ossit point on the north and the town of Racisce on the south is clear of danger and readily recognised. Ossit point at a distance appears to be a detached islet; St. Giovanni point, high and with a convent on it, will be next seen on the north, and Kneza point, the south point of the entrance, which is woody and of moderate height, on the south. Between these points the narrows, about half a mile wide, is clear and deep.

Lat.  $42^{\circ} 59'$  N.  
Long.  $17^{\circ} 1'$  E.

Proceeding eastward, a vessel may anchor in Rosario or Kuciste roads, or pass through the eastern end of the channel with the Sabbioncello shore aboard, keeping northward of all the islets and dangers. At night, the

Plan,  
1,611 [806].  
Var. 7° 30' W.

*red* light of Curzola and the *white* light of Sestrice islet will be left on the south, and the *red* light of Orebic on the north.

**Entering the channel from the eastward**, the Sabbioncello shore should be closed with, and a course steered northward of all the islets at the entrance; or, with a fair wind and the aid of the plan, the passage northward of Bisaza and between Badia and Maizan may be taken.

The ordinary set of the current through the channel is westward and its speed is sometimes considerably accelerated by strong, easterly winds. Northerly and north-easterly winds are dangerous to sailing craft, the northern side of Curzola, when westward of Ossit point, being then a lee shore and affording no shelter; it is advisable to close with the southern side of Lesina, and if necessary, either anchor in the Torcola channel or run under the lee of Curzola. With southerly winds, either port Lesina, Torcola, or port Luka may always be reached.

**CURZOLA ISLAND**, ancient *Corcyra Nigra*, is one of the most important islands on the coast of Dalmatia. It is nearly 27 miles in length, and from 3½ to 4 miles in breadth, with a chain of mountains covered with oak and pine trees, suitable for shipbuilding, extending from one extreme of the island to the other. The most remarkable elevation, mount Dobrovaska, is 1,863 feet high, and presents either a conical or a forked summit according to the direction from whence it is viewed. The inhabitants are few in proportion to the area of cultivable ground; their chief occupation is shipbuilding and fishing; the vine and olive are grown. There are bridle roads from the various anchorages to the interior.

The coasts, generally, have deep water close to. The anchorages at the western end are convenient for vessels navigating the eastern shore of the Adriatic, especially when overtaken by heavy southerly winds.

**Proisd island.**—This island is about three-quarters of a mile in length, 79 feet high, and lies at the north-west extreme of Curzola, from which it is separated by a boat channel with 6 feet water about 1½ cables wide. The western end of Proisd is bordered by a rocky spit extending a quarter of a mile off-shore; the shoal water between this island and Curzola extends northward, and has on it an islet or rock, beyond which, a short half mile from Proisd, is Bacili rock, 19 feet high, with 11 fathoms water between it and the other rock mentioned. At 1½ miles eastward of Bacili rock and a quarter of a mile from the shore, is Goricik, a little islet 23 feet high.

**The North Coast** of Curzola island from Goricik islet eastward to about opposite the western extreme of the Sabbioncello peninsula, is sparsely inhabited and covered with trees. The coast line is bold and irregular with several coves, but affording no shelter whatever for large vessels. The water is everywhere deep, and there are no hidden dangers except a sunken rock close to Prohodistee point\*, 6 miles westward of port Racisce; and the Naplovac rocks 19 feet high, and Blaca rocks close to the shore but with deep water between them and it. Coasting craft seldom approach this coast as, with northerly winds, it is a dead lee shore with no anchorage.

**Prigradica cove**, about two-thirds of a mile westward of the western Naplovac rock, is a small indentation of the coast, from the south-east side of which a mole projects in a north-west direction inside which small craft may find shelter.

The north coast of Curzola farther eastward is included in the description of Sabbioncello channel, southern shore, page 225.

Chart,  
2,712 [803].

Lat. 42° 57' N.  
Long. 17 0 E.

Lat. 42° 59' N.  
Long. 16 36 E.

\*Lat. 42° 58' N.  
Long. 16 53 E.

Long. 16° 49' E.

**Light.**—From the mole end in Prigradica cove, a *fixed red* light elevated 19 feet above the sea is exhibited, visible in clear weather from a distance of 3 miles between the bearings S. 78° W., through south and east, to N. 43° W. Cannot be lighted in strong N.E. winds.

Chart,  
2,712 [803].  
Lat. 7° 30' W.

**West and south coasts.**—**Grande (Vallegrande) bay** occupies the whole western end of Curzola island between Proisd and Kenirat points, and has good anchorage for vessels of any size. The town of Valle Grande, where there is a telegraph station, is at the head of the bay.

Plan of Valle-  
grande bay on  
1,611 [806].  
Lat. 42° 58' N.  
Long. 16° 40' E.

The best anchorage for large vessels is east of Ossiak islet. The available space is nearly a square half mile, with depths of from 18 to 20 fathoms, sand, and well sheltered, being open only to winds from W.N.W. The most secure place in the bay for small vessels is Plitvine cove, an indentation on the northern side of the bay. Here they anchor in 8 to 13 fathoms, sand and mud, and make fast to the weather shore. There is also anchorage for small vessels off the town in from 6 to 12 fathoms, and higher up in a narrow and landlocked arm in depths of 2 to 3 fathoms.

Lat. 42° 58' N.  
Long. 16° 43' E.

Ossiak islet, in the entrance, is 4 cables in length east and west, 2 cables in breadth, 213 feet high, and is covered with bushes.

**Port St. Giovanni.**—About 6 cables northward of the west end of Ossiak islet is the small port of St. Giovanni, which has a depth of from 2 to 2½ fathoms and is much visited by coasting vessels, being conveniently situated for getting under way. A peninsula of the same name, with a church on its summit, and joined to the shore by a narrow rocky neck, forms its southern side; the entrance is divided into two passages by St. Giovanni (Gubessa) islet, northward of which is the proper channel, where also there is a strong outdraught at the commencement of the ebb tide.

**Kamenjak islet.**—About one mile north-westward of Ossiak islet is Kamenjak islet, 49 feet high, and about 4 cables W. ¾ S. from the latter is a shoal with 3½ fathoms water; about 7 cables W. by N. ¾ N. from the same islet and off a point projecting from the northern side of the bay, is a 5-fathoms patch.

**LIGHT.**—On **Vranac point**, at an elevation of 23 feet above the sea, a *fixed* light is exhibited from an iron post, visible in clear weather from a distance of 4 miles, and showing *red* when bearing from S. 61° E., through east, to N. 19° E. (except where obscured by Ossiak island, and other land); *white* over the port.

**Directions.**—Mount Hom, a conical hill completely covered with trees, rises 1,237 feet above the sea immediately over the southern side of Vallegrande bay and indicates its position. On approaching the land, the high wooded point of Kenirat on the southern side of entrance, and Proisd island on the north, will be readily recognised and a course may be steered for Ossiak islet, leaving Kamenjak islet and the 3½-fathoms shoal on the port hand; both sides of Ossiak are clean.

Chart,  
2,712 [803].

**Potplat cove.**—On the southern side of Vallegrande bay is Potplat cove with a depth of 8 to 13 fathoms; it is exposed to westerly winds and the holding ground is bad.

**COAST.**—**Tre Porti.**—Between Kenirat point and Cinca point 2 miles south-eastward of it, the coast is high with two small coves; northward and eastward of Cinca point is an inlet with the port of Tre Porti at its head, the westernmost anchorage on the southern coast. It has room for small coasting vessels only.

Lat. 42° 55' N.  
Long. 16° 40' E.

Chart,  
2,712 [803].  
Var. 7° 30' W.

Extending 2 miles in a south-easterly direction from Cinca point are four islets; Terstenic, the nearest to the point and the largest is 65 feet high; between it and the point is a clear and deep channel 2 cables wide leading into the port. Between Terstenic and the second islet, the channel is rather wider than the former and also deep and clear.

Prznjak, the third islet, is 85 feet high and united to the second islet by a flat with only 2 fathoms water. Lukovac, the outer and smallest of the four, is 55 feet high; and, midway between it and Prznjak, the depth is 14 fathoms, but the Gredica rock, 6 feet above water, lies in mid-channel in the inner part of the passage. These islets cover port Tre Porti and break the sea.

Plan of ports  
Carboni, &c., on  
1,611 [806].

**Islets.—Anchorages.**—At  $1\frac{1}{2}$  miles north-eastward of Lukovac islet there commences a chain of islets, rocks, and shoals, which skirt the coast of  $4\frac{1}{2}$  miles eastward; Zvirinovic, the westernmost and largest of these islets, at a distance appears as two, having two peaks 216 and 199 feet high respectively; between these islets and the shore small vessels find excellent shelter.

Lat. 42° 55' N.  
Long. 16° 44' E.

**Port Carboni** is between Zvirinovic islet and the coast of Curzola; it is about a mile in length, less than  $1\frac{1}{2}$  cables in width, with a depth of from 7 to 14 fathoms, weedy bottom, and is secure from all winds. The ordinary anchorage is abreast some fishermen's cottages, from which a road leads to the town of Blatta. Carboni is generally preferred by vessels wind-bound in this part of the Adriatic, as its two passages enable them to quit with any wind. Firewood is the only supply obtainable.

**Directions.**—When approaching port Carboni from the southward, mount Kula, 1,037 feet high, bearing about N. by W., indicates the position of the eastern entrance. When intending to enter by this channel, Obiak islet, 150 feet in height, which is sugar-loaf shaped and covered with bushes to the top, will be recognised and the vessel should pass between it and Zvirinovic, keeping the eastern end of Zvirinovic islet aboard to avoid a  $4\frac{1}{2}$ -fathoms shoal in the middle of the channel. Gubessa islet, a large rock, 51 feet high, farther in should be left on the port hand; but it is steep-to and in case of necessity may be passed on either side.

When bound to Carboni from the westward, either of the channels already described between the islets off Cinca point may be taken, but the current is rapid between these islets and should be considered in approaching them.

Lat. 42° 54' N.  
Long. 16° 48' E.

**Port Tre Pozzi.**—Between the coast of Curzola and the four easternmost islets of the rocky chain is a channel nearly 4 cables wide, known as port Tre Pozzi and affording good anchorage in a depth of 16 fathoms, sand and gravel. Westerly and south-easterly winds send in a considerable sea.

**Directions.**—When bound to port Tre Pozzi, its position may be known by mount Morkan which rises to a height of 1,060 feet within three-quarters of a mile of the northern shore of the port. The four islets forming its southern side, when seen at a distance, present a low whitish line, standing out in relief from the dark ground of Curzola. Vessels visiting port Tre Pozzi should never pass between the islets, the spaces being very narrow, the current strong, and the depth of water only from 2 to 4 fathoms.

The eastern entrance to the port is between Verkovnjak islet, 102 feet high, and Otocac islet which is close to the shore and united with it by

a 2-fathoms ridge; there are shoal patches of 4 and  $4\frac{1}{2}$  fathoms in this entrance to the anchorage, which, in a vessel of deep draught, should be avoided. The best anchorage, about 17 to 18 fathoms, is opposite Sridnjak, the middle of the three largest islands.

Plan of ports  
Carboni, &c. on  
1,611 [806].  
Var.  $7^{\circ} 30'$  W.

The western channel is between Kosor and Stuppa islets, 9 cables apart; in this channel there is a 3-fathoms patch, a  $2\frac{3}{4}$ -fathoms patch, and Beretta rock 6 feet high between Prisba point and Stuppa islet, to be avoided; for the position of these dangers, as well as for those in the eastern entrance, the seaman is referred to the plan as the best guide.

**Port Berna**, on the north-western side of Veli Zaglav point, has good anchorage for vessels of light draught in a depth of 3 to 5 fathoms, sandy bottom, at the head of the eastern arm. The customary precautions should be taken against the Bora; cables are generally carried to the shore. Larger vessels anchor farther out in 20 fathoms. Veli Zaglav point is 240 feet high and well wooded; a rocky shoal with 3 fathoms water lies  $1\frac{1}{2}$  cables westward of the point, which should have a wide berth in rounding.

Lat.  $42^{\circ} 54'$  N.  
Long.  $16^{\circ} 51'$  E.

From Veli Zaglav point to cape Speo, the shore is rocky and steep-to, uninhabited, thickly wooded, and with the exception of a few coves, without a single place of shelter.

**COAST.**—The south coast of Curzola, eastward of port Berna, to cape Speo, the east extreme of the island, is steep-to in most places, but there are a few coves available to small coasters with off-shore winds.

Charts,  
2,712 [803].  
2,713 [805].

**CAPE SPEO**, the eastern extreme of Curzola island, and south point of the eastern entrance to Sabbioncello channel, is  $3\frac{1}{4}$  miles distant from the nearest land of the Sabbioncello peninsula, and from it the western extreme of Meleda island, bears S.S.E.  $\frac{1}{4}$  E. distant  $9\frac{1}{2}$  miles. With the exception of a 2-fathoms shoal extending half a cable south-eastward from the cape, the water is deep in all directions around it; see view of cape Speo and islands northward of it on plan No. 1,611.

Lat.  $42^{\circ} 55'$  N.  
Long.  $17^{\circ} 12'$  E.

**CAZZA ISLET** is the westernmost of the chain of islands, islets, and rocks on the south side of Lagosta channel; it is uninhabited, except occasionally in the summer by shepherds who find pasture for their flocks. It is nearly  $2\frac{1}{2}$  miles in length, 797 feet high, and steep-to all round; the southern side is lower than the northern, and on the eastern side is a bay sheltered from northerly and westerly winds but which is not a safe anchorage, and a vessel caught in the Bora off the island should, if possible, make for Lissa island; failing in the attempt, the gulf of Manfredonia on the Italian coast, between 60 and 70 miles to the southward, would be the best shelter to run for.

Chart,  
2,712 [803].  
Lat.  $42^{\circ} 46'$  N.  
Long.  $16^{\circ} 31'$  E.

**LIGHT.**—On Gradisca point, the south-western extreme of Cazza islet, is a quadrangular lighthouse painted red and white in vertical stripes, rising from the centre of the keeper's dwelling, which is of two stories and 65 feet in height. From it is exhibited at an elevation of 308 feet above the sea, a *flashing white* light showing a flash every *six seconds*, visible in clear weather from a distance of 24 miles. The light is obscured by the land from the north-eastward between the bearings S.  $41^{\circ}$  W. and S.  $81^{\circ}$  W.

**Cazziol islet**, situated 10 miles eastward of Cazza, is 305 feet high; it is uninhabited and covered with brushwood and stunted trees. The shore is steep and the soundings round it, though irregular, are generally

Lat.  $42^{\circ} 45'$  N.  
Long.  $16^{\circ} 43'$  E.

Chart.  
2,712 [803].  
Var. 7° 30' W.

deep. At little more than 4 cables off the south-western point of the islet, is a rocky 2-fathoms shoal. In southerly winds, fishing vessels resort to Lenard cove, a small bay on the northern side of the islet, which has a depth of from 12 to 17 fathoms, sand, with a sunken rock close to the western point of entrance. The south-eastern side is the best for landing.

Biclaz is a small round islet or rock, 52 feet high, steep-to, and distant  $1\frac{1}{2}$  miles N.W. by W.  $\frac{1}{2}$  W. from the western end of Cazziol; 3 cables eastward of the rock is a 10-fathoms patch.

Lokovac (Pod Kopiste), a small islet 98 feet high and steep-to, lies a quarter of a mile northward of Cazziol.

Cernac, another rocky islet 46 feet high, about half a mile eastward of Cazziol; there is a 9-fathoms patch a quarter of a mile N.E. by E. and an 8-fathoms patch N.E. by N. one mile from this rock.

Lat. 42° 46' N.  
Long. 16 7 E.

**Markiara islet**, situated nearly  $2\frac{1}{2}$  miles eastward of Cazziol, is about  $1\frac{1}{4}$  miles in length north and south; it is 397 feet high, and is composed of several small woody hillocks; its seaward shores are steep, especially on the south-western side, and the water deep. There are no hidden dangers in the channel between it and Cazziol, but the current is rapid.

Pod Markiara is a small islet 52 feet high, half a mile off the north-western face of Markiara; the north-western side of this rock is foul and should have a wide berth.

Markiara islet is separated by a narrow channel from Priestap island eastward of it; there are two little islets or rocks on the shoal extending from Markiara in the northern part of the channel, and the least depth in mid-channel is  $5\frac{1}{2}$  fathoms.

Lat. 42° 46' N.  
Long. 16 44 E.

**Priestap island** forms with the western end of Lagosta the ports of Lago grande and Lago piccolo; the island is  $1\frac{1}{2}$  miles in length, 508 feet high, and separated from Lagosta by a very narrow channel over shallow rocky ground, by which small vessels of light draught pass at high water from Lago grande on the south to Lago piccolo on the north. The current between Priestap and Lagosta is strong.

**LAGOSTA ISLAND**, ancient *Ladestum*.—This island, on the southern side of which is an important lighthouse, is generally made by vessels passing either up or down the Adriatic. It is 6 miles in length east and west, high, and with a peak near the centre; the highest parts are well wooded, except seaward, where they are steep and barren. Mount Hum, the highest part of the island, is 1,368 feet above the sea and covered with pine trees; St. Giorgio chapel stands on its summit. Mount Debelo Blezevo is another peak equally remarkable and nearly as high, about half a mile south-westward of mount Hum. The shores of the island are bold, and, with the exception of the south-eastern side, are irregular, with deep water and several rocky heads, to avoid which the chart must be the guide. There are about 1,400 inhabitants, of whom many are fishermen. Wine, oil, firewood, and salt fish are the chief articles of commerce. The only village, Lagosta, is on one of the highest hills on the northern side; it is defended by a fort on a conical hill eastward of it.

Plan of ports  
Lago on 1,611  
[806].  
Lat. 42° 45' N.  
Long. 16 44 E.

**PORT LAGO GRANDE** is formed between the southern part of Priestap island and the western end of Lagosta; it has sufficient space for a number of vessels secure from all winds. The entrance is between Barbaros point, Priestap island, and Baskerat point, off which a sunken ledge extends two-thirds of a cable; the navigable channel is about  $2\frac{1}{2}$  cables wide.

Near the centre of the harbour is St. Raffaele islet, 82 feet high and with a church on it; the anchorage is either northward or southward of the islet, in depths of 16 or 26 fathoms, sand and shell. Small vessels may moor in the coves of Priestap, or in St. Pietro bay on the south-eastern side of the port.

Plan of ports  
Lago on 1,611  
[806].  
Var. 7° 30' W.

Water may be had at St. Pietro bay near a church, but it is brackish and indifferent. Firewood is the only other article procurable.

**Directions.**—There are three passages into this port; viz., between the shoal off Baskerat point and Bratinottok (Bratin Otok) islet; between the latter and Vlassenik (Vlasnik) islet; and between Vlassenik islet on the one side, and Markiara and Priestap islets on the other. Irregular currents of wind frequently occur among this group of islets.

Cazziol islet, and mounts Hum and Debelo Blezevo on Lagosta, are good marks when approaching from the westward. Bratinottok islet is 262 feet high, wooded, of whitish appearance, steep on the southern side, and may be recognised at some distance; Baskerat point may be known by large red patches on its southern side.

Both winds and currents are frequently irregular and strong between Lagosta and the islets and rocks westward of it.

**Port Lago Piccolo** is an indentation at the north-western end of Lagosta island; it is protected on the west by the northern part of Priestap islet and by the little islet of Maslenjec, which is covered with bushes, off its northern point. The passage in is clear and deep,  $1\frac{1}{2}$  cables wide, and leads to a landlocked anchorage about 3 cables square with a depth of 20 fathoms, and room farther in for small vessels in 8 or 9 fathoms, thus affording good shelter from the Bora, but difficult of ingress and egress in a sailing vessel.

Lat. 42° 46' N.  
Long. 16 50 E.

Prihodisce, the eastern point of entrance, is 223 feet high, the land immediately within it falls to 12 feet and rises again to 237 feet in height, causing the point at a distance to appear as an island.

**COAST.—Port Chiave.**—The northern coast of Lagosta is deeply indented with bays and coves; of these, port Chiave is the anchorage chiefly resorted to by coasting vessels for the convenience of its vicinity to Lagosta village, about a mile eastward of it.

Chart,  
2,712 [800].  
Lat. 42° 46' N.  
Long. 16 53 E.

A small islet or rock at the entrance affords partial protection from the northward; the channel is on the eastern side of the islet, as a reef of rocks nearly awash lies between it and the western shore. The anchor should be dropped near the middle in 5 or 6 fathoms, mud, and a hawser taken to the islet. In this position, only northerly and north-easterly winds are much felt.

**Telegraph cable.**—A telegraph cable is laid from the shore near St. Michele islet, about three-quarters of a mile eastward of port Chiave, to Stiniva cove, Curzola.

**SOUTH COAST of Lagosta.—Port Rosso.**—This small landlocked port is at the north-eastern angle of the large bay on the southern side of Lagosta; the depth in the centre of the port is from 5 to 6 fathoms, mud, with only  $3\frac{1}{4}$  fathoms at the entrance, which is too narrow to be taken without a leading wind.

Lat. 42° 44' N.  
Long. 16 53 E.

The bay in which the port lies has sufficient space and depth for vessels of the deepest draught, but it is not a safe anchorage and should be resorted to only in a Bora or during westerly winds; those between S.W. and S.E. blow dead in and raise a heavy sea. The only spot which can be recommended as shelter in a gale is in a depth of 18 fathoms under the lee of the high land of Skrigeva point, on the eastern side of the bay.

Chart,  
2,712 [803].  
Var. 7° 30' W.

**LIGHT.**—On the high land of Skrigeva point is a conspicuous white lighthouse rising from the keeper's dwelling 56 feet high from which is exhibited at an elevation of 342 feet above the sea, a *fixed white* light, visible in clear weather from a distance of 25 miles between the bearings of S. 77° E., through east and north, to S. 86° W. This light being on the southern coast of Lagosta is very important to the navigation of the Adriatic. See view of Skrigeva point and lighthouse on chart.

**Signal station.**—The lighthouse is connected with the telegraph system. Vessels may communicate by the International Code.

**Directions.**—When entering port Rosso with southerly or southeasterly winds, vessels under sail should be prepared for eddy winds from the high land. Skrigeva point may be rounded closely when arriving from the eastward; and, Svegliegamora, the western point, when arriving from the opposite direction. Care must be taken to avoid a rocky shoal in the bay with one fathom water, situated 7 or 8 cables eastward of the western point and about  $3\frac{1}{2}$  cables from the shore. There is also a shoal with  $4\frac{1}{2}$  fathoms north-eastward of the one-fathom patch and about  $2\frac{1}{2}$  cables from the shore in the middle of the bay; and another with  $1\frac{1}{2}$  fathoms on the western side of Svegliegamora point.

**ISLETS AND ROCKS.**—Eastward of Lagosta island are two groups of islets, rocks, and shoals; the western group, lying within a radius of about  $3\frac{1}{2}$  miles of Norikum point, the eastern point of Lagosta, consists of four principal and ten smaller islets or rocks, ranging in height from a little above water to 272 feet, the larger islets being covered with bushes.

Lat. 42° 47' N.  
Long. 17° 0' E.

**Markienda rock**, 6 feet high, is situated on the reef of the same name; this reef extends 4 cables north-westward of the rock, is two-thirds of a mile in length north-west and south-east, with  $1\frac{1}{2}$  to 3 fathoms water on it, and is steep-to. The Markienda rock is distant nearly a mile N.N.E.  $\frac{1}{2}$  E. from the eastern point of Mladine islet.

**The Tajan**, the two northernmost islets, extend over a space of about 4 cables; the larger islet is 49 feet high and lies N. by W.  $1\frac{1}{2}$  miles from Markienda rock.

**Markienda (Mrkenta) Biela rock** is small, round, and 10 feet high; it lies  $8\frac{1}{2}$  cables eastward of Mladine islet and the same distance southward of Markienda rock. The islets and rocks just described lie in a north-north-west and opposite direction from each other for a distance of nearly  $2\frac{1}{2}$  miles, and are the easternmost of the western group.

Between these and Lagosta are the larger islets Mladine, Cesvenica, Krusica, and Stromorin, with many rocks and shoals, and deep water around and between them. In taking the channel between them and the eastern end of Lagosta, great caution is required and the chart is the best guide.

**LAGOSTINI ISLETS.**—The Lagostini or eastern group, consisting of nine small islets or rocks, extend east and west  $3\frac{1}{2}$  miles, and form a line of breakers. As the currents in the vicinity of all these islets may be strong or irregular, and as the water is deep and the dangers steep-to, it is advisable to give them a wide berth. They are all more or less frequented by fishermen.

Lat. 42° 45' N.  
Long. 17° 5' E.

**Sestrice islets.**—The three western islets of the Lagostini group are the Sestrice, of which the largest is 52 feet high; about three-quarters of a mile westward of the Sestrice is Ankovica shoal with 4 fathoms water. Between these islets and the Markienda Biela rock north-westward of them, the channel is  $2\frac{3}{4}$  miles wide, and, with the exception of the

4-fathoms shoal, clear and deep, but the current through is irregular and at times rapid; vessels from the southward prefer passing between the eastern end of the group and Meleda island.

Chart,  
2,712 [803].  
Var. 7° 30' W.

**Glavat**, the eastern islet of the Lagostini group, on which stands a lighthouse, is small and round, 72 feet high, and steep-to, except on the western side; from it, the western extreme of Meleda island lies East, distant  $7\frac{3}{4}$  miles.

**LIGHT**.—From a stone octagonal tower above dwelling, 84 feet high, on the summit of Glavat islet, at an elevation of 149 feet above the sea, is exhibited a *fixed and flashing* light with a period of *two minutes*, thus:—*Fixed white, one minute; five red flashes of six seconds duration*, during the next *minute*. The light is visible when bearing from N. 84° E., through north and west, to S. 58° E. In clear weather the *white* light is visible from a distance of 16 miles; *red* flashes at 13 miles.

Lat. 42° 46' N.  
Long. 17° 9' E.

**LAGOSTA and MELEDA CHANNELS**.—These channels are continuations of each other; the former is between Lagosta island and the Lagostini islets and rocks on the south, and Curzola island on the north; the latter is between the Sabbioncello peninsula and Meleda island. The general depths are from 30 to 50 fathoms.

Charts,  
2,712 [803].  
2,713 [805].

In the Lagosta channel, the only dangers (night only) are the Tajan islets, 49 feet high, just described; the ordinary westerly current sets through it, and, when accelerated by easterly winds, troublesome eddies are caused at the western entrance. With a southerly wind, the Curzola shore should be approached in order to be in a position to seek, if necessary, one of the anchorages at its western end, but as there are no anchorages in the eastern part of the channel, caution is necessary in sailing vessels to guard against a sudden fall of wind which may be accompanied by an increasing sea.

Lat. 42° 50' N.  
Long. 16° 50' E.

In the winter season, the Bora blows heavily in this channel, and it is prudent to endeavour to reach port Rosso or some other shelter at the first symptoms of its approach, in order to avoid the necessity of bearing up for Manfredonia or of lying-to under the lee of the island. In the Meleda channel, the ordinary westerly set of current occurs, except in the winter season during easterly winds when the direction is generally about W.N.W. Southerly and south-easterly winds raise a heavy sea, especially on the Sabbioncello coast, which should be avoided as these winds seldom blow home. With the Bora, a vessel should keep near this side but at a safe distance.

**MELEDA CHANNEL, north shore**.—The coast from Giuliana bay (page 225) to the south-east extreme of the Sabbioncello peninsula, forms the northern side of Meleda channel; it is high and of whitish aspect with scattered patches of brushwood. With the exception of a  $1\frac{1}{2}$ -fathoms shoal about  $1\frac{3}{4}$  cables from the shore and 4 cables south-eastward of Alessandria islet, the water is everywhere deep and the shore bold. It is almost uninhabited, without any good anchorage, and subject to sudden north-easterly squalls, especially towards the close of day; it is therefore advisable to keep as close to the shore as possible.

Chart,  
2,713 [805].  
Lat. 42° 53' N.  
Long. 17° 25' E.

Small vessels occasionally anchor at port Prapatna, about 12 miles south-eastward of Giuliana bay, where they secure to the shore. There is no village in the immediate neighbourhood, but a path leads from this little port to the town of Stagno,  $1\frac{1}{2}$  miles north-eastward of it. The whole of this coast is backed by high land, the mountains rising immediately over it.

Lat. 42° 49' N.  
Long. 17° 40' E.

Chart,  
2,713 [805].  
Var. 7° 20' W.

**Telegraph cable.**—From the eastern shore of port Prapatna, a telegraph cable is laid to a position  $2\frac{1}{2}$  cables westward of Pusta point, port Mezzo Meleda.

**SOUTH SHORE.—MELEDA ISLAND**, ancient *Melita*, is the south-easternmost of the larger islands of Dalmatia. It is  $20\frac{1}{2}$  miles in length, with an extreme width of about 2 miles, and consists of a series of wooded hills with a deep depression at about one-third from its eastern extreme, and appears, when seen from the northward, like two groups of islets. Its highest part, mount Velki Grad, 1,686 feet above the sea, is near the centre; the northern side of the island is wooded and well cultivated; the opposite side is a rocky sterile country, except towards the western extreme where there is an extensive pine forest.

There are about 1,600 inhabitants whose principal occupations are agriculture and fishing. There are six small towns or villages, of which the chief is on the southern slope of mount Velki Grad. See view A on chart No. 2713.

The southern coast is rocky, barren, and without any anchorage, and should not be closely approached. The northern coast, in Meleda channel, is easy of access and has one or two anchorages.

**PORT PALMA**, at the western end of Meleda, is sheltered by an irregular forked projection terminating in Goli rat point, the western extreme of the island; and, trending northward, it forms with the coast eastward of it, Port Palma affording anchorage for small vessels. The inlet is about 7 cables in length, from  $1\frac{1}{4}$  to  $2\frac{1}{2}$  cables in breadth, and is sheltered northward and north-eastward by Galica and Pomestak islets, the latter 148 feet high, whitish at the base, and covered with brushwood to the summit.

Vessels anchor southward of Pomestak islet in depths of 16 to 21 fathoms and make fast to it; and, farther down the inlet on the south, in about 12 fathoms, sand and mud. The entrance is between the north-eastern extremes of the point, which forms a fork, on the starboard hand, and the two small greyish-coloured islets Cerna Seka and Galica, together with Pomestak islet, on the port hand.

The land of Goli rat point is a high irregular strip and is a good mark. Cerna Seka, the outer islet in front of the entrance, is shoal all round, and should not be approached too closely. Silj, a small islet immediately northward of Goli rat point and a long cable from the shore, is also foul.

From Goli rat point, the northern coast of Meleda eastward to port Palazzo, a distance of about  $3\frac{1}{2}$  miles, is irregular, with several islets and sunken rocks, the latter being near the shore and mostly within Glavat, the northern or outer islet, which is steep-to. At  $1\frac{1}{4}$  cables off the eastern head of Stupe bay and more than three-quarters of a mile from Stupe point, the western point of entrance to port Palazzo, is a sunken rock on which the sea breaks.

**PORT PALAZZO** is a bay on the northern side and near the western end of Meleda, formed by Stupe and Krizine points, about 2 miles apart, the entrance of the bay being occupied by the four rocky islets, Kobravac, Ovrat, Moracnik, and Tainic. Between the islets and the points are four entrances to the bay, all of which are deep and clear of dangers except that westward of Moracnik, and in which, as well as in the bay itself, are several good anchorages. The port is westward of the islets, and the most sheltered position is abreast the ruins of a palace, from whence it is said to derive its name; it has depths of 7 to 12 fathoms, mud; vessels also anchor between the islets and the shore eastward of the narrowest part of

Plan of port  
Palma, on chart  
2,713 [805].  
Lat. 42° 48' N.  
Long. 17 20 E.

Plan of port  
Palazzo, on chart,  
2,713 [805].  
Lat. 42° 47' N.  
Long. 17 23 E.

the port in 19 or 20 fathoms water. Rogac cove at the head of the bay is almost landlocked.

Plan of port Palazzo, on chart, 2,713 [805]. Var. 7° 20' W.

The islet of Kobravac is the largest of those fronting Palazzo bay; it is nearly  $1\frac{1}{2}$  miles in length, of little breadth, lies parallel with the shore of Meleda, and protects a narrow channel from three-quarters of a cable to 2 cables in width; the other three islets are smaller and lie northward and westward of it. These islets range from 105 to 331 feet in height.

The bay from Tainic, the inner islet, is about a mile deep, the narrowest part being contracted to less than  $1\frac{1}{2}$  cables in width, with a landlocked basin at its head having a depth of 6 to 7 fathoms; in the south-western corner, the shore is bordered by shallow rocky ground, which extends more than a cable off-shore.

**Temporary anchorage.**—The anchorage most frequented for temporary purposes is that between Kobravac islet and the shore of Meleda in from 17 to 23 fathoms, sand and mud; a better berth is farther westward between the western end of Kobravac and Tainic islet. The Kula rock, above water, lies in the middle of the eastern entrance to the channel between Kobravac islet and Krizine point. Palazzo is considered one of the best ports of the Dalmatian islands, but its space is rather limited and the islets at the entrance render access somewhat difficult in a vessel under sail, but, according to the wind, one or more channels would be always available.

**Directions.**—In making for port Palazzo, Goli rat point, the western extreme of Meleda, will be readily recognised; the land is thickly wooded, and the four rocky islets described present a barren whitish aspect. In southerly winds, a vessel should be prepared for sudden heavy squalls in the narrow passages between the islets. In taking the western pass between Stupe point (which has shoalground extending 60 yards eastward) and Moracnik islet, the north-western shore should be closed in order to clear the rocks awash near Moracnik; but vessels of deep draught should avoid this passage, as shoal water extends into it both from the southern end of Moracnik and from the point opposite, contracting the deep water to very narrow limits. Small vessels should here keep in mid-channel.

In the other passages, a mid-channel course should be followed, the points of the islets being foul, especially Moracnik and Ovrat.

**PORT MEZZO MELEDA** is about  $8\frac{1}{2}$  miles eastward from the eastern entrance to Palazzo; the intervening coast is straight with deep water close-to, and affords no shelter. The entrance is between Pusta point on the north-west and Badanj islet on the south-east, about 5 cables apart. The port consists of two bays and is a convenient anchorage for wind-bound vessels if a berth be chosen with reference to getting under way with a fair wind. The anchorage for vessels of deep draught is in 35 fathoms, sand, in the westernmost of the bays. The northern shore where the depth is from 16 to 27 fathoms, sand, should be preferred, being the best sheltered from winds from this quarter. A point in the south-western side of the bay is bordered by rocks, and another rock lies near the northern shore in the inner part. About 3 cables westward from Badanj islet is a rocky bank with 6 fathoms water which should be avoided when taking up a berth between the two bays. The shores are backed by well-wooded hills.

Chart, 2,713 [805]. Lat.  $42^{\circ} 44'$  N. Long.  $17^{\circ} 36'$  E.

**Lights.**—On Pusta point is shown, from a mast at the side of a white house, 27 feet high, at an elevation of 45 feet above the sea, a *white fixed* light visible 2 miles, when bearing from S.  $15^{\circ}$  E., through south and west, to N.  $52^{\circ}$  E.

When the Austrian-Lloyd's steamers are expected, usually twice a week, a *white* light is shown from the beach to the southward of the above light.

Chart,  
2,713 [805].  
Var. 7° 20' W.

**Telegraph.**—A submarine cable connects Meleda with the mainland. It is laid between the eastern side of Port Prapatna and the valley westward of Pusto point, entrance to port Mezzo Meleda.

**Directions.**—The position of port Mezzo Meleda is easily distinguished, being at the before-mentioned depression of the land. In entering between Pusta point on the starboard hand and Badanj islet on the port hand, the former should not be too closely approached, as a shoal with the Supenak rock, awash, extends nearly half a cable north-eastward. To clear the rock at night, the light should be kept at a cable's distance until it bears westward of W. by S.  $\frac{1}{4}$  S.

**Coast.**—From Mezzo Meleda to Gruj point, the eastern extreme of Meleda, the coast is irregular, with deep water, and one or two small islets or rocks close to. At  $1\frac{1}{2}$  miles eastward of Mezzo Meleda is port Chiave, a small bay or cove with 10 fathoms water, partially protected on the north by three islets, of which Borovac, the most northern, has a sunken rock off its north-western end. Three-quarters of a mile beyond Borovac islet, off the eastern side of Maharci point, is a shoal with  $2\frac{1}{2}$  fathoms water. Three-quarters of a mile south-eastward of this is the small port of Camera; and, at the northern extreme of the eastern end of Meleda, is port Cima di Meleda, between Cima islet and the shore.

These ports are only adapted for the smallest coasters.

Lat. 42° 41' N.  
Long. 17 45 E.

**Gruj point**, the eastern extreme of Meleda,  $4\frac{1}{2}$  miles farther on, is the termination of a peninsula 491 feet high, and has a bay or cove on either side. About  $1\frac{3}{4}$  cables from the south eastern face of the point is a shoal covered by 4 fathoms water, and with a depth of 17 fathoms between it and the shore.

Between the eastern end of Meleda on the south, and Giuppana and Jaklian islands on the east and north, is the eastern entrance of the Meleda channel, about 3 miles wide, which is seldom entered except by coasting vessels on their way to the Sabbioncello channel.

**South coast.**—Along the southern coast of Meleda, the water is deep and there is no shelter whatever, the whole coast being exposed to south-westerly winds and sea. Temporary anchorage in fine weather may be found in Sablonava cove on the western side of the Gruj peninsula, and for a small vessel, at port Inganatore,\* near the entrance to the Lago Grande and about 4 miles from the western end of the island. A small islet or rock here and there lies off the coast, but scarcely beyond the distance of half a mile; as, however, there is nothing to be gained by nearing this coast it is better to give it a wide berth.

\*Lat. 42° 46' N.  
Long. 17 24 E.

**The CALAMOTTA CHANNEL**, commencing at the southern extreme of the Sabbioncello peninsula, is the in-shore channel between the coast of Dalmatia and several small islands and islets extending parallel with the coast as far as port Malfi. It about 12 miles in length, and from 7 cables to a mile in width with central depths of 25 to 35 fathoms; the channel is easy to enter at all seasons, and its shores afford some of the best and most important anchorages in the Adriatic. The holding ground is good almost throughout.

**The main entrance** is the Bocca Grande, at the south-east end of the islands forming the channel, page 241.

**ISLANDS on south side.**—**Olipa island.**—**Bocca Inganatore.**—Between Olipa, the north-western island of this chain, and Nosize point, the south-eastern extreme of the Sabbioncello peninsula, is the Bocca Inganatore, an entrance leading to the Calamotta

and Stagno channels; it is too narrow to be considered easy even with a commanding breeze, though the steep rocky shore is of bold approach. The summit of Olipa, 692 feet high, is covered with bushes. Nosize point is uncultivated and overgrown with impenetrable brushwood.

Chart.  
2,713 [805].  
Var. 7° 16' W.

Port Ladro is on the north-western side of Olipa; here a vessel of deep draught may moor sheltered from all winds.

**LIGHT.**—On the south end of Olipa island is a white square stone tower, 300 yards westward of the keeper's dwelling, from which is exhibited at an elevation of 103 feet above the sea, a *fixed red* light, visible in clear weather from a distance of 9 miles, when bearing from S. 69° E., through east, to S. 80° W.

Lat. 42° 45' N.  
Long. 17° 47' E.

**Bocca Falsa.**—Jaklian island is  $2\frac{3}{4}$  miles in length, and lies south-eastward of Olipa; between them is the Bocca Falsa, the second narrow passage from the northward leading into the Calamotta channel. The passage is contracted to about a quarter of a mile in width by rocks awash off Seka point, the north-western extreme of the island.

Four small islets lie off the north-eastern shore of Jaklian, forming with it good anchorages for small vessels. Of these anchorages the first, or north-western, is in a depth of 18 fathoms, gravel and shells, south-eastward of Tajan islet which is covered with brushwood; the second is south-westward of Cerkvina islet, in 15 fathoms, mud; the third, with Kosmec islet, 85 feet high, bearing about W. by S., or S.E. by E., either position being well protected from the Bora.

The Bocca Falsa should not be attempted in sailing vessels with south-easterly winds or with the Bora; calms, and eddy currents setting towards the shore, are of constant occurrence. It is occasionally used in north-westerly winds, and, if so, after passing Olipa, the vessel should be kept close hauled until beyond Tajan islet and certain of weathering Misnjak islet, as the wind often heads as Maestro bay opens out.

Lat. 42° 45' N.  
Long. 17° 47' E.

Jaklian island is easily identified; its centre is 38 feet above the sea and is a blanched stony peak; the southern shore is rocky and precipitous; the northern side is covered with brushwood interspersed with cultivated patches, and there are a few houses on its eastern extreme.

**GIUPPANA ISLAND** lies south-eastward of Jaklian and is separated from it by Pompejana strait, the third channel from the northward into the Calamotta channel. The north-western part of Giuppana overlaps Jaklian within it, and a projecting point from the former forms this narrow tortuous strait which is but seldom used. If a vessel should be forced to attempt this passage, the Giuppana shore should be kept close aboard so as to avoid the rocks in the south-western angle of the pass, and to be enabled to anchor if necessary; the inner part of Giuppana point, forming the pass is foul.

Giuppana is  $4\frac{3}{4}$  miles in length, and nearly  $1\frac{1}{2}$  miles in breadth; its northern part being 794 feet in height; it is the largest and most thickly peopled of this group of islands. It may be recognised by the coniform mount St. Ullia,\* 732 feet high, about one-third from its south-eastern end; the shores are rocky and bold; near the coast is a series of rocky wooded hills with fertile valleys; farther inland is a rich plain, on which are grown the vine, olive, and all kinds of fruit.

\*Lat. 42° 43' N.  
Long. 17° 53' E.

**Luka cove.**—The north-western coast of Giuppana forms with that of Jaklian island a long bay protected on all sides; the bottom throughout is hard mud, and vessels may safely anchor in any part, near enough to the shore to lay out cables to it. Luka cove, at the head of the bay, has sufficient space for several vessels, and it would be preferable to all the other Calamotta anchorages were it not so far from the mainland and so difficult of access in south-westerly winds.

Chart,  
2,713 [805].  
Var. 7° 15' W.

Luka village is close to the shore at the head of the cove.

**Light.**—A *fixed red* light, elevated 18 feet above the sea is exhibited from an iron standard on the landing pier in Luka cove, visible in clear weather from a distance of 6 miles.

**Telegraph.**—There is a submarine telegraph cable across the Calamotta channel from a small bay at the north end of Giuppana island, south of Misnjak island, to the mainland north-eastward.

The landing places of the cable are marked by small stone buildings, 10 feet high. There is a telegraph station at Luka.

**Caution.**—Vessels are prohibited from anchoring in the vicinity of the cable.

Lat. 42° 41' N.  
Long. 17° 57' E.

**MEZZO ISLAND AND STRAIT.\***—Mezzo island lies south-eastward of Giuppana, and is separated from it by Mezzo strait, which is the fourth channel from the northward and one of the best into the Calamotta channel, especially in north-westerly winds.

The island is nearly 2½ miles in length, 700 feet high, and has a bay both on its north-western and south-eastern sides; its south-western and north-eastern sides are rocky and bordered at a short distance by reefs. It contains about 700 inhabitants, chiefly mariners; the soil is fertile, the vine and olive flourish, and several flocks of sheep find pasture.

Rudda islet (265 feet high), which lies in the inner part of Mezzo strait, reduces the width of the channel to about 7 cables, and makes it somewhat impracticable to beat through with south-easterly or northerly winds, or in any other than fine weather.

Shallow water with a small rock extends a quarter of a mile north-westward of Rudda, and the Marnic, another rock, lies close off the north extreme of Mezzo.

A vessel in Mezzo strait unable to weather Rudda should not attempt to pass between it and Giuppana on account of the shoal extending north-westward of the islet, which would necessitate too close an approach to Giuppana, but should rather anchor under the lee of Mezzo in a depth of about 22 fathoms.

**Anchorage.**—Mezzo strait affords good anchorage for vessels prevented by calms or contrary winds from proceeding through the Calamotta channel, both in St. Giorgio cove, Giuppana, westward of Rudda islet, where vessels anchor abreast the village in depths of 8 to 11 fathoms, excellent holding ground; and, in Mezzo road, a small bay at the head of which is the village of Mezzo. The road is sheltered from easterly and south-easterly winds, but those from the westward send in a considerable sea; the best berth is in the middle of the bay in 11 to 18 fathoms, mud and sand.

In the small bay on the south-eastern side of Mezzo island, westward of Palughe point, there is good shelter from northerly and westerly winds, but a heavy sea is sent in by those from S.E. The best berth is near the middle of the bay in 4 to 9 fathoms, sand. When approaching from the southward a berth must be given to the rocks at the southern point of the bay.

About 3 cables south-eastward of the point is the small islet of Skupielli, 50 feet high, with a 3-fathoms shoal off its eastern side.

**CALAMOTTA ISLAND AND STRAIT.**—Calamotta is the easternmost of the islands, and is divided from Mezzo island by Calamotta strait, leading into Calamotta channel; being very short, it is easily taken even with a scant wind. Near the fairway, off Cavalika point,

\* See views of Mezzo, Calamotta, mount Petka, &c., on plan of port Ragusa, 1582 [807].  
General chart, 1,440 [789].

Lat. 42° 41' N.  
Long. 17° 56' E.

Lat. 42° 40' N.  
Long. 17° 59' E.

is Cavalika shoal, with about one fathom water, marked on its north-western side by a nun buoy surmounted by a staff and white ball; the best channel is between the buoy and Mezzo, but there is a depth of 8 fathoms between the shoal and Calamotta. Chart,  
2,713 [805].  
Var. 7° 15' W

Calamotta island is smaller than Mezzo; the western portion is 410 feet high, and covered with pine trees; on the remainder are grown the fig and olive. It contains about 400 inhabitants.

The south-western coast of Calamotta is rocky and thickly overgrown with bushes; it forms a bend in which refuge may be taken from a Bora, in depths of from 12 to 18 fathoms, at from  $1\frac{1}{2}$  to 3 cables from the shore; both inside and outside this distance the bottom is rocky. There is also anchorage near the middle of the small bay at the northern extreme of Calamotta island, but vessels should not proceed too far in. North-westerly winds only are much felt here; the holding ground is good.

**St. Andrea**, a high barren rock with a convent on it, and precipitous on its south-western side, lies in the southern approach to Calamotta strait, at rather more than  $1\frac{1}{2}$  miles southward of Mezzo island, and serves to point out the passage.

**LIGHT**.—On the north-western or highest part of St. Andrea (or Donzella) islet is a stone lighthouse 57 feet high from which is exhibited at an elevation of 223 feet above the sea, a *fixed and flashing* light with a period of *thirty seconds* showing as follows:—*White fixed, twelve seconds; white flash, three seconds; white fixed, twelve seconds; red flash, three seconds*. The light is visible in clear weather from a distance of 21 miles. Lat. 42° 39' N.  
Long. 17 57 E.

**BOCCA GRANDE**, between Calamotta island and the Pettini islands or rocks, is the south-easternmost passage into the Calamotta channel; it is also the largest and most frequented, especially by vessels from the southward, being  $1\frac{1}{4}$  miles wide and clear of danger. The water close to the Pettini rocks is deep, but, as the current is strong, they should not be too closely approached. Lat. 42° 39' N.  
Long. 18 2 E.

This passage may be easily recognised by mount Petka, a double hill 648 feet high, covered with fir trees and with high reddish-brown cliffs on its sea face, and terminating westward in Petka point, off which are the Pettini rocks, a line of small abrupt islets of reddish colour; and, at night, by St. Andrea, Pettini, and Ragusa lights. Plan of Ragusa  
on 1,582 [807].

There is also a narrow pass between the shore and the Pettini rocks, sometimes convenient for small craft with local knowledge, in order to keep to windward in north-easterly winds. In the middle of it there is a rock which shows at low water and which should be left to the eastward.

**LIGHT**.—On the summit of the outer Pettini island or rock is a stone lighthouse 41 feet high, from which is exhibited, at an elevation of 88 feet above the sea, a *fixed white* light, visible in clear weather from a distance of 11 miles. Lat. 42° 39' N.  
Long. 18 3 E.

**GREAT STAGNO CHANNEL** is an inlet in the Sabbioncello peninsula and a continuation for 5 miles north-westward of the Calamotta channel; it is three-quarters of a mile wide at the entrance and narrows towards the head, where are the town and fort of Stagno, from whence the distance across the peninsula to Stagno Piccolo is only about two-thirds of a mile. Chart,  
2,713 [805].  
Lat. 42° 47' N.  
Long. 17 46 E.

It affords good anchorage under its northern shore for  $3\frac{1}{4}$  miles up, where there is a depth of 10 fathoms; thence it carries from  $2\frac{1}{2}$  fathoms to half a fathom at its head. It is not, however, often visited, being rendered very unhealthy, especially in summer, by north-westerly winds, which

Chart,  
2,713 [305].  
Var. 7° 15' W.

Lat. 42° 50' N.  
Long. 17 42 E.

traverse extensive salt marshes; it might, however, be a convenient temporary refuge for a vessel obliged to enter the channel by the Bocca Falsa, if unable to reach Maestro bay. Small craft moor abreast of Kabas village, larger vessels anchor northward of it.

The rise and fall of the tide is from one foot to eighteen inches; at low water the mudbanks at the head of the inlet emits noxious exhalations. At the town or village of Stagno small supplies of water and provisions may probably be obtained.

**Lights.**—At Broce on the south-western side, about  $1\frac{1}{2}$  miles from the head of the channel, a small *fixed red* light is exhibited from the head of the mole, visible 3 miles; it cannot be lighted during south-easterly gales.

At Stagno mole-head a small *fixed red* light is shown, visible about 2 miles.

**Maestro bay** is the largest and best anchorage in the Calamotta channel. The northern shore between Budina cove and port Slano should be preferred, and it is customary, in anticipation of a Bora, for small vessels to lay out cables to it. The depth near the middle of the bay is about 32 fathoms, greenish mud, and from 11 to 22 fathoms, sand and mud, at a short distance along the shore.

In calms or contrary winds, the coast between Budina cove and Doli bay to the westward, should not be approached in a sailing vessel, as submarine springs occasion considerable eddies. Budina and Janska coves and Doli bay afford good shelter to coasting vessels.

**Water.**—There is an excellent watering place on the mainland about one mile southward of Maestro bay; it is in the little shingly bay of Sladienovic, and may be known by the small church of San Giovanni close to the beach.

**Port Slano** is nearly landlocked; the entrance is  $1\frac{1}{2}$  cables wide between Dolnja and Gornja points on the mainland opposite the northern end of Giuppana island. It is a mile in length, from  $2\frac{1}{2}$  to 4 cables in width, with a depth of 8 to 18 fathoms, better protected from the Bora than any other of the Calamotta anchorages, and sheltered from south-easterly winds, during which it can be entered without any difficulty. The land breeze, which generally blows at night, facilitates departure. The holding ground is mud and is generally good.

Osmine bay, on the port hand within the entrance, should be avoided as the bottom is rocky.

Port Slano is so situated with regard to the two southern passages to Calamotta channel that it may be entered from thence in the heaviest south-easterly winds.

Dolnja point, on the north-western side of entrance, is bordered by a rocky shoal to the distance of about half a cable, and a similar shoal surrounds Gornja point, opposite. There is anchorage outside, near Gornja point in deep water, the sea sent into the channel by sirocco winds being but slightly felt here.

**Light.**—From a mast at the south corner of the keeper's dwelling at Dolnja point, on the north-western side of entrance to port Slano, a *fixed white* light is exhibited at an elevation of 49 feet above the sea, visible in clear weather from a distance of 5 miles, when bearing from S. 83° E., through north and west, to S. 47° W.

**Buoy.**—Off the village, at the north-eastern end of the port there is an iron mooring buoy in a depth of  $7\frac{1}{2}$  fathoms.

Plan of port  
Slano, on chart  
2,713 [305].  
Lat. 42° 46' N.  
Long. 17 53 E.

**Slano village.**—Water in abundance may be procured from a stream on the eastern shore, not far from Slano village, which is near the head of the port and communicates by a good road with Ragusa. Chart.  
2,713 [805].  
Var. 7° 10' W.

**Anchorage.**—There is anchorage off the valley of Slano at the head of the port, in about 6 fathoms, and in about 12 fathoms half way between it and the entrance.

**Telegraph.**—There is a telegraph station at Slano.

**Temporary anchorage in Calamotta channel.**—One of the best anchorages in the Calamotta channel, is between Calamotta island and the mainland. Large vessels seeking shelter from a south-easterly gale generally anchor in a depth of about 15 fathoms, sand and hard mud, with St. Andrea islet on with Cavalika point, the western extreme of Calamotta island; here the swell from outside is felt, but south-easterly winds seldom last long enough to raise a heavy sea. This anchorage may be easily reached in south-easterly winds, and can be quitted without difficulty with any wind. Lat. 42° 41' N.  
Long. 18 0 E.

Vessels never anchor in mid-channel when anticipating bad weather, but on entering from the southward proceed to port Malfi, or, if prevented by stress of weather, to the anchorage in Calamotta bay, on the north-western side of the island.

**Port Malfi** is an inlet about a mile in length, and an average breadth of 2 cables, with depths of from 13 to 9 fathoms. South-westerly winds raise a considerable sea, the entrance lying immediately opposite the Bocca Grande; the only good shelter is in the coves on the western shore. The best anchorage is in Soline cove, with cables to the shore against the Bora which here blows violently. Veliki-Zaton cove is fit for small vessels only. Abreast of Malfi, on the western side of the port, is a shoal with  $2\frac{1}{2}$  fathoms water. Lat. 42° 41' N.  
Long. 18 3 E.

Malfi is preferred, by sailing craft to Gravosa and Ombla, being of easy entrance in south-easterly winds and easily quitted in those from the opposite quarter. The shores are exceedingly picturesque, particularly at Mali-Zaton bay at the foot of a hill the base of which is covered with vines and olive trees amid numerous dwellings.

**Water.**—Vessels formerly frequently visited this port to procure water on the northern shore, from a stream on which are several mills.

**Daksa islet.**—When entering Calamotta channel by the Bocca Grande, the entrance to Malfi, immediately opposite, will be readily recognised, as also Daksa islet to the eastward in the fairway of the channel leading to Ombla and Gravosa. On Daksa is a battery, a convent, and a lighthouse. Lat. 42° 40' N.  
Long. 18 3 E.  
Plan of Ombla  
inlet,  
3,675 [3,722].

**LIGHT.**—On the north end of Daksa islet, 40 yards within its extreme, a *fixed red* light is exhibited from an octagonal stone tower on keeper's dwelling 40 feet high, at an elevation of 65 feet above the sea, visible in clear weather from a distance of 10 miles. The light is obscured when bearing from North to N. 41° W.

**Ombla inlet.**—Sailing craft occasionally anchor close to the winding northern shore of this long narrow inlet to avoid the Bora which sometimes blows violently in the direction of its length. Southerly and south-westerly winds send in a swell but do not last long and are never very inconvenient. The depths are from 17 fathoms at the entrance to 7 and 4 fathoms near the head. Both shores are covered with houses amid gardens and cultivated ground, to which the inhabitants of Ragusa resort in the hot season. Lat. 42° 40' N.  
Long. 18 5 E.

Plan,  
3,675 [3,722].  
Chart,  
2,713 [805].  
Var. 7° 10' W.

Owing to its narrowness and length, about 2 miles, the inlet is not easily reached in a vessel under sail without a favourable wind, especially in the winter, when the outgoing current is strong. In the event of the wind failing at the entrance, it is advisable for a sailing vessel to come to in the vicinity of Daksa islet and to warp or tow to the anchorage if not convenient to wait for a breeze.

Between Malfi and Ombla, the coast affords excellent shelter in a depth of 18 to 20 fathoms, green mud and sand. This shore is sterile and has few inhabitants; westward of Malfi, it is covered with habitations and well cultivated. This eastern anchorage and also port Malfi are convenient for vessels bound to, but unable to enter, Gravosa during south-easterly winds.

**Water.**—A stream of excellent water empties itself at the head of Ombla inlet. Some craft of 8 feet draught may ascend to the source about three-quarters of a mile beyond, where the water rushes out in a clear stream from the mountain side.

**Telegraph cables.**—Five telegraph cables cross the entrance of Ombla inlet, starting from a position 200 yards eastward of Cantafico point on the southern shore to a position about 550 yards eastward of Leandra point on the northern shore. Both ends are marked by beacons or small turrets and no vessel should anchor within at least half a cable of this vicinity.

**PORT GRAVOSA**, on the southern side of the entrance to Ombla inlet from which it is separated by Cantafico point, lies between that point and the Lapad peninsula; it has not much anchorage space for large vessels within the port, the shores and head of the harbour being bordered by banks of mud with 3 and 2 fathoms of water on them. There is, however, a narrow channel, decreasing from 15 to 6 fathoms, about half a mile in length; in the fairway, south-westward of Cantafico point light, the bottom is rocky, with a depth of 15 fathoms; this portion should be avoided when seeking anchorage.

It is a snug harbour, and, including the space within Daksa island in the approach, will contain some 40 or 50 vessels. It has frequently been the rendezvous of squadrons of men-of-war, especially of the International squadron in 1880, which squadron however moved to the gulf of Cattaro as a preferable winter anchorage.

Vessels wintering here, moor in the middle of the harbour, and secure to the north-eastern shore, being there greatly protected from Bora squalls, which blow violently over the high hills; heavy gusts are also felt with sirocco winds, but the water is always smooth.

In the vicinity of its shores, as with Ombla inlet, are numerous villages surrounded by cultivated grounds, affording a pleasant summer retreat for the inhabitants of Ragusa, which town is less than 2 miles distant by land. Vessels of considerable size were formerly built here of oak from the forests of Dalmatia and from Meleda and Lagosta islands, the planking and masting being procured at Fiume.

**Anchorage.**—A berth will be found in the outer part of the harbour with the anchors in a depth of 11 fathoms, mud, and the stern secured in  $3\frac{1}{2}$  fathoms to the north-eastern shore, where there are mooring bollards at convenient distances. Except on this shore the holding ground is indifferent, being soft mud, and as large vessels visiting the port must lie

in mid-channel, they are liable to drag their anchors, unless properly moored.\*

**Buoys and beacons.**—A rock with  $2\frac{1}{2}$  fathoms of water lies off the eastern shore, about  $1\frac{1}{2}$  cables north-westward of the coal stores; it is marked by a white pyramid beacon buoy; there is a depth of  $3\frac{3}{4}$  fathoms inside this rock, and from 6 to 9 fathoms on its western side, but the bottom is foul. Sipak rock, with  $2\frac{3}{4}$  fathoms, lies about one cable W. by N. of it, on the opposite side of the channel and is unmarked.

Plan of port  
Gravosa,  
3,675 [3,722].  
Lat.  $42^{\circ} 40'$  N.  
Long.  $18^{\circ} 5'$  E.  
Var.  $7$   $10$  W.

There is a warping buoy and a mooring buoy in the approach to port Gravosa; also two mooring buoys in the port for the convenience of small steamers.

A rocky bank extends some little distance off the northern front of the Lapad peninsula; its position is indicated by a white stone truncated pyramid 10 feet high. The shore westward of this is bordered by a rocky shoal overlaid by mud.

**Lights.**—At the north-west extremity of the reclamation works near Cantafico point, two vertical *fixed green* lights elevated 19 and 25 feet, respectively, above the sea are exhibited, visible in clear weather from a distance of 3 miles between the bearings of S.  $8^{\circ}$  W., through south and east, to N.  $11^{\circ}$  W.

On the north-west extreme of the quay, about three-quarters of a cable N.  $72^{\circ}$  W. from St. Nicolo church, a *fixed* light is exhibited, elevated 18 feet above the sea and visible 3 miles, showing *red* when bearing from S.  $54^{\circ}$  E., through east, to N.  $16^{\circ}$  E.; *white* elsewhere.

On the south-east extreme of the quay a *fixed green* light is exhibited, visible 2 miles.

On the new mole head farther in, a *fixed* light, elevated 18 feet above the sea, is exhibited, visible one mile; it shows *red* when bearing from S.  $47^{\circ}$  W., through south and east, to N.  $14^{\circ}$  W.; *white* elsewhere.

**Harbour works.**—Between Cantafico point and the coal sheds to the south-eastward, a reclamation of the foreshore is being carried out, and further works are in hand within the new mole; at the head of the harbour dredging operations are in progress.

**Coal and Supplies.**—About 2,000 tons of Welsh coal are kept in stock at Gravosa, for the use of the Government and the Austrian Lloyd's Company; foreign vessels are only supplied with this in cases of necessity. There is usually about 600 tons of Bosnian coal in private hands. Vessels coal alongside a pontoon connected with the shore at the coal stores, about two-thirds of a cable northward of the Sta. Croce mole. Water and provisions of all kinds may be procured, fresh provisions being plentiful.

**Lifeboat.**—There is a lifeboat station at port Gravosa.

**DIRECTIONS.**—**Calamotta channel.**—Mount Timor, which rises to the height of 2,954 feet above the sea, over Maestro bay, is the commencement of the high land which extends parallel with this part of the Dalmatian coast. The mount is a good mark for approaching the various passages to the Calamotta channel from the westward; it opens well out on the left from the chain of mountains in the interior, and its bare rounded summit overtopping the surrounding land may be seen at a great distance. Mezzo, and then the other islands, will subsequently appear, and the choice of passage may then be determined according to the circumstances of wind and weather.

Lat.  $42^{\circ} 50'$  N.  
Long.  $17^{\circ} 52'$  E.  
Chart.  
2,713 [805].

\* Austrian men-of-war secure thus:—An anchor is let go near the north-eastern shore and a hawser run out to the rocks, hove taut, and its bight lashed to the cable, of which 8 or 10 fathoms is then eased out so that the connection shall be well under water for the ship to swing over it. Should a Bora come on, there is said to be always sufficient warning to allow of a wire hawser or chain cable being run out to the rocks.—H.M.S. *Alexandria*, 1880.

General chart, 1,440 [789].

Chart,  
2,713 [805].  
Var. 7° 10' W.

Plan of port  
Gravosa and  
Ombla inlet.  
3,675 [3,722].

When approaching from the eastward, the high land near Ragusa should be steered for as soon as visible in order to profit by the westerly current along the coast. In south-easterly winds, vessels should beware of heavy squalls over Lapad bay and out of Ombla inlet, which draw more eastward than the regular breeze. The coast between the Pettini rocks and Ragusa is bold and covered with bushes.

**In proceeding to Ombla or to Gravosa,** Daksa islet may be passed on either side. In passing southward of it, and between it and the two hillocks crowned by a battery, the Daksa side of the channel should be preferred on account of the shallow bank bordering the opposite coast. Between the batteries near Lapad point and the entrance to Gravosa also, the shore should be avoided as it is bordered by rocks.

**Entering Gravosa,** the fairway should be kept, passing within half a cable of the buoy marking the rock on the eastern side of the port, anchoring as before directed.

**Lapad (or S. Martino) bay,** between Lapad point and Pettini islands or rocks, is resorted to by small craft for protection against Bora and sirocco gales. The anchorage is in a depth of 12 to 14 fathoms. Both Petka and Lapad points are high and covered with trees.

**Light.**—Pettini outer rock, *see* page 241.

Plan of port  
Ragusa on  
1,582 [807].  
Lat. 42° 38' N.  
Long. 18 7 E.

**RAGUSA.**—The town of Ragusa is prettily situated, surrounded by a fortified wall the greater part of which is washed by the sea and commanded by Fort Imperial, on a hill 1,350 feet high. The environs are well cultivated and have numerous handsome dwellings. Ragusa was formerly a rich republic of 40,000 inhabitants, and, like Venice, traded to all parts of the world; it has now dwindled to about 8,500, of whom a large number are mariners, who carry on a considerable commerce in arms, salt, rice, &c., which are exchanged for grain, wood, and cattle brought from Herzegovina. *See* view on plan 1,582.

Port Cassone, a cove on the eastern side of the town, has space for a few small vessels in about 2 fathoms water. South-easterly winds cause a heavy sea at the opening into the port, which is between two small moles, rendering entrance difficult and at times impracticable.

The Austrian Lloyd's steam vessels call in the roadstead twice a week to and from Trieste.

**Lights.**—On the molehead at port Cassone, a *fixed red* light, visible in clear weather from a distance of 6 miles, is exhibited at an elevation of 25 feet above the sea. This light is masked by Lacroma island between the bearings N. 6° E. and N. 28° W. It cannot be lighted during strong south-easterly gales.

On Pescaria molehead a *fixed* light is exhibited 17 feet above the sea, showing *green* over the entrance from N. 69° W. to N. 48° W.; *white* elsewhere.

**Coal.**—About 4,000 tons, Welsh, the property of the Austrian Government, and from 800 to 1,000 tons of coal belonging to private firms, is kept here. There is a coal wharf 330 feet in length, with a depth of 10 feet alongside.

**Water** may be procured from an aqueduct near the lazaretto, at a short distance eastward from the town.

**Meteorological table.**—*See* page 378.

**Railway.**—There is a railway from Ragusa to Costelnuovo, Topla bay, Cattaro gulf.

**Telegraph.**—Ragusa is a telegraph station.

**Lacroma island**, in the approach to the port, is rocky, steep-to, and nearly a mile in length north and south; it is from 180 to 298 feet high, and when seen from the south-westward appears to be divided into two at the middle; Fort Royal stands on its northern part.

Plan of Ragusa  
on 1,582 [807].  
Lat. 42° 37' N.  
Long. 18 7 E.  
Var. 7 5 W.

**The roadstead** is between the town of Ragusa and Lacroma island, and has depths of 8 to 15 fathoms. It is exposed to a heavy sea during south-easterly winds, at the first sign of which, it is the custom for vessels to weigh and proceed to Calamotta channel; or, if obliged to remain, to haul close under the northern shore of the island, and make fast to stone bollards provided for the purpose. In this position they often ride out heavy weather, but this anchorage should be resorted to in the summer season only, and it is almost the only one on the coast of Dalmatia where vessels moor to the shore against south-easterly winds.

**Mooring buoy.**—There is a mooring buoy in the road, fit for a heavy vessel.

**Landmarks.—Directions.**—Mount Snieznica is a good guide in making Ragusa or any port on this part of the coast; it is about 12 miles eastward of Ragusa, 4 miles inland, and 4,050 feet above the sea. It has a bare summit and may be easily recognised, being one of the highest mountains on this part of the coast; and, between it and the mountains bordering the gulf of Cattaro, the land is comparatively low. On a nearer approach, Fort Imperial, which is visible at a great distance, indicates the position of the town and anchorage.

Chart,  
2,713 [805].  
Lat. 42° 34' N.  
Long. 18 21 E.

**BRENO BAY.**—Between Ragusa and Pellegrino point, a distance of 3½ miles, is a barren rocky coast with deep water close in-shore. Immediately north-eastward of Pellegrino point is Breno bay, with good anchorage in its eastern part for vessels of any draught either in Bora or south-easterly gales; the depth is from 15 to 20 fathoms, and the bottom is greenish mud mixed with shells and gravel, or with seaweed. A heavy sea is raised by south-westerly and north-westerly winds, when it is necessary to avoid anchoring close to the shore.

Lat. 42° 36' N.  
Long. 18 18 E.

In these winds, small craft generally resort to port Tiha, the little indentation in the southern part of the bay, on the eastern side of the town of Ragusa Vecchia, where they secure to the shore the anchor otherwise not holding in the weedy bottom.

Plan of Ragusa  
Vecchia on  
1,582 [807].

The Breno valley in the northern part of the bay is a plain surrounded by high land, and is rather extensive; being well sheltered, it is thickly planted with vines and olive trees. Water is obtained from a river running through the valley and flowing into the sea close to the village of Kupari. The water of the Gliuta rivulet, in the eastern part of the bay, is not drinkable.

**Directions.**—Mount Strazistje, 2,320 feet high, and about 1½ miles eastward of the anchorage, is a good distant mark for vessels making for Breno bay, but it is advisable to make the land well to the eastward, on account of the westerly current. Large vessels should take the clear passage northward of Bobara and St. Pietro islets. There is a passage between St. Pietro and St. Rocco point, but the Superka rock and bank nearly midway must be carefully avoided.

Lat. 42° 36' N.  
Long. 18 15 E.

**RAGUSA VECCHIA approach.**—**Merkan and Bobara islets**, with six or seven large rocks, lie off the south-western side of Breno bay and extend nearly 1½ miles north-west and south-east, affording protection from south-westerly winds both to Breno bay and Ragusa Vecchia.

Plan of Ragusa  
Vecchia on  
1,582 [807].  
Var. 7° 5' W.

Merkan islet, 220 feet high, with some ruins on it, is the south-easternmost and largest; it lies 6 cables outside San Stefano point, the southern extreme of Breno bay, and has scattered rocks near the shore here and there, but otherwise the water is deep.

Bobara, the north-western and smaller islet, is 147 feet high, and, like Merkan, has a chain of rocks extending south-eastward from it, leaving a clear opening however between them and Merkan. These islets have steep rocky coast lines, and the current between them and the mainland runs at the rate of about half a mile an hour north-westward.

**St. Pietro islet**, about 2 cables in length and 59 feet high, is nearly in a line joining points Pellegrino and St. Rocco, and about 5 cables from the latter, which is the extreme of the little peninsula on which stands the town of Ragusa Vecchia. Between St. Pietro and St. Rocco point is the Superka rock above water, and surrounded by a rocky bank, about a cable in extent.

**RAGUSA VECCHIA.**—The town of Ragusa Vecchia occupies the site of ancient *Epidauros*, on a little promontory in the southern part of Breno bay; the inhabitants, who number about 700, are chiefly seafaring men. The ground in the immediate neighbourhood is well cultivated, but at a very short distance the land becomes high and barren. Water and small supplies of provisions may be obtained.

**The port** of Ragusa Vecchia is between the peninsula on which the town stands, and the projecting tongue of land south-westward of it, terminating in San Stefano point; it is open to the north-west. It is about 4 cables in length and from one to 2 cables in width, with depths decreasing from 10 to 11 fathoms in the middle to 3 fathoms at the head.

It has space for a few small vessels only, which haul close in and make fast to the shore.

**Shoals.—Buoy.**—A rocky one-fathom spit extends more than a cable south-westward from St. Rocco, the northern point of entrance to the port; at 2 cables westward of this spit is a shoal, with  $1\frac{1}{2}$  fathoms water, and with a depth of 4 fathoms round it; this latter depth is over a space of about  $1\frac{1}{2}$  cables in length and is steep-to.

A white spar buoy is moored in  $4\frac{3}{4}$  fathoms close eastward of the shallowest part of this shoal.

The channels into the port are on either side of the above shoal, but that between the shoal and San Stefano point is the wider of the two.

**LIGHT.**—From an iron standard 2 cables southward of St. Rocco point, and 20 yards within the shore, at an elevation of 33 feet above the sea, is exhibited a *fixed* light showing as follows:—*Green* when bearing from S. 15° E. to S. 44° E., over Superka rock and the spit extending westward from St. Rocco point; *white* from S. 44° E. to S. 63° E.; *red* from S. 63° E. to East, over the shoal fronting the port; *white* from East to N. 60° E.; obscured elsewhere. In the *white*, *red*, and *green* sectors the light is visible in clear weather from a distance of 7, 5, and 2 miles, respectively. The *white* sectors denote the fairways.

Port Tiha, eastward of it has been referred to on the preceding page.

**THE COAST** between Ragusa Vecchia and point d'Ostro on the western side of the entrance to the gulf of Cattaro, a distance of about 18 miles south-eastward, is rugged and of forbidding aspect. It is backed at a short distance inshore by mountainous land, covered here and there with trees. See view B on chart, No. 2,713. The depth is considerable

Chart,  
2,713 [805].

near the shore, which should be given a wide berth as the sea breaks heavily in strong sea winds, and violent eddies are caused by the current during succeeding calms or light winds. Chart, 2,713 [805].  
Var. 7° 0' W.

**Albatross rock.**—At 174 yards from the shore and 8 cables north-westward of Patkio point, about  $4\frac{1}{2}$  miles south-eastward of San Stefano point, is a rock discovered in 1883 by an Austrian man-of-war of this name striking on it; the rock is covered with 10 feet water, and has from 5 to 12 fathoms between it and the shore, but it is quite steep-to, seaward. Lat. 42° 32' N.  
Long. 18 17 E.

**Great and Little Molonta.**—About 6 miles north-westward of point d'Ostro is a small steep rocky peninsula with projections both north-westward and south-eastward forming a bay on either side. The port of Great Molonta is the north-western bay; it is considered merely a temporary refuge from a south-easterly gale for sailing vessels which may contrive to reach it before the wind has attained great strength. It is open north-westward from whence a heavy sea at times sets in. There is a depth of 13 fathoms, soft mud and sand, at the entrance, and about 7 fathoms at the head. It is usual to anchor near the middle and lay out cables to the shore against the Bora. Plans of ports  
Molonta on  
1,463 [809].  
Lat. 42° 28' N.  
Long. 18 25 E.

Little Molonta, the south-eastern bay, is greatly protected by Molonta islet and by a large rock on its north-eastern side, both detached from the southern projection of the peninsula: it is quite safe for small vessels in a Bora or during north-westerly winds. South-easterly winds send in a heavy sea, but there is no danger if the vessel be properly moored in a good berth before bad weather sets in. The depth is between 4 and  $5\frac{1}{2}$  fathoms, sand, gravel, and shells, good holding ground. Water of good quality may be procured here.

**Light.**—A *fixed red* light, elevated 29 feet above the sea, is exhibited on the north-east side of the entrance to Little Molonta, visible in clear weather from a distance of 6 miles. May not be lighted during strong winds.

**Directions.**—The small sailing vessels which frequent Little Molonta do not attempt it with south-easterly winds and rough weather, owing to the sea and to the outset then found at the narrow entrance between the rock and the mainland. Neither is it advisable to attempt to enter either of these ports early in the forenoon, as even a fresh south-easterly breeze commonly fails on a near approach to the land at that time, and a considerable sea would probably be encountered.

Mount Ilino brdo, 1,840 feet high with the chapel of St. Elia on its summit, slopes to the shore about 3 miles northward of the Molonta peninsula; this, and the high lands of Cattaro, southward, sufficiently point out the position of the Molonta ports; and, on nearing the peninsula, its greyish wall-like sides are readily recognised. The country in the vicinity is covered with brushwood. Lat. 42° 30' N.  
Long. 18 23 E.

## CHAPTER IX.

COASTS OF DALMATIA AND ALBANIA FROM THE GULF OF  
CATTARO TO VALONA BAY.

Charts,  
2,713 [805],  
2,701 [808].

**THE COAST.**—General remarks.—The Dalmatian portion of this coast, from point d'Ostro at the entrance to Cattaro gulf, to Dubovica point, 24 miles south-east of it, embraces the gulf of Cattaro and approaches. Like the rest of the coast of Dalmatia, it is backed at a short distance inland by a chain of mountains and is generally steep-to. The adjacent country is populous, well wooded, and fertile; the vine is cultivated and produces excellent wine.

\*Lat. 42° 10' N.  
Long. 18 58 E.

**The Albanian** shore between Dubovica point\* and cape Linguetta, at 105 miles southward of it, recedes considerably, the head of the gulf of Drin as much as 25 miles. The coast is high and bordered by a continuation of the mountains of Dalmatia as far as the neighbourhood of Dulcigno, where it becomes lower; thence to the Bojana river, the country is flat near the sea. Between the Bojana and St. Giovanni di Medua it is slightly raised and has the appearance of a wall; inland of St. Giovanni di Medua is a vast sandy plain intersected by marshes and bounded by mountains. Southward of St. Giovanna di Medua, the high lands in the interior disappear except in the vicinity of Durazzo† and southward of cape Linguetta.

†Lat. 41° 20' N.  
Long. 19 26 E.

Almost the whole coast of Albania is composed of sandy bays, interrupted occasionally by high, steep, rocky points of land. Between the entrance of the gulf of Cattaro and Dulcigno, the water is generally deep; but, between Dulcigno and Valona bay to the southward, it becomes much shallower and the bottom is affected considerably during heavy rains and when the rivers are full; attention should therefore be given to the lead when in proximity to this part of the coast.

**The productions** of the soil are wine, corn, oil in small quantities, and tobacco of good quality.

Plans,  
1,463 [809],  
419 [810].  
Lat. 42° 24' N.  
Long. 18 33 E.  
Var. 7 0 W.

**GULF of CATTARO.**—General remarks on anchorage.—This gulf affords excellent anchorage, but for a sailing vessel it is often difficult and even dangerous of access and exit during October, November, December, and January; it is however, second to few ports in the Mediterranean for a large fleet. The gulf is about 16 miles in extent, east and west, and consists of four basins, viz., Topla, Teodo, and Rizano bays and the gulf of Cattaro proper; for, although the four basins are usually included under the general name of the gulf of Cattaro, the eastern one on which the town of Cattaro stands is that specially so called.

These basins being surrounded by high land, the greatest caution is necessary, particularly in selecting an eligible berth for anchoring, owing to the suddenness and violence of the squalls which rush down from the elevated valleys both on the northern and eastern sides; but, on the whole, and not including the entrance, they may be considered to afford good anchorages with sufficient depth of water for almost any number of vessels of the deepest draught.

Near the centre of the basins, the bottom is generally mud; nearer the shores, the mud is mixed with sand and shells.

Vessels are warned not to anchor in the vicinity of the telegraph cables, whose positions are presently described.

Charts.  
2,713 [805].  
2,701 [809].  
Var. 7° W.

**Aspect.—Making the land.**—On sighting the land with the intention of entering the gulf, mounts Radostak,\* 4,744 feet high, and Lovcen or Sella, 5,770 feet high, are excellent guides in clear weather, when they may be seen at a great distance; but during south-easterly or south-westerly winds they are generally obscured, and do not become visible until sufficiently near for the lower parts of the land to be seen. The southernmost mount, Lovcen or Sella,† is conspicuous on approaching the coast from any quarter, and, as its names implies, is saddle-shaped; it lies 13 miles from point d'Ostro, at the entrance, and is only  $2\frac{3}{4}$  miles south-eastward of the town of Cattaro at the head of the gulf. Mount Radostak is  $2\frac{1}{2}$  miles northward of the nearest shore in Meljine bay. See view on plan No. 1,463.

\*Lat. 43° 29' N.  
Long. 18 35 E.

†Lat. 43° 24' N.  
Long. 18 49 E.

In nearing the gulf, the white lighthouse on point d'Ostro, the western point of entrance, is conspicuous, and together with the fort just below it, Mamula fort on Rondoni islet which is 50 feet high and lies in the entrance channel, and the small round fort on Arza point on the eastern side, makes the entrance easily distinguishable.

The numerous villages and detached houses on either side, and the cultivation of the lower grounds extending to the very base of the lofty mountains, whose summits appear almost to overhang the shores, render the whole aspect of this gulf one of extreme beauty as well as of magnificent grandeur.

**Winds.**—The land wind in the gulf of Cattaro often lasts until late, so that, on nearing point d'Ostro, a vessel may lose even a fresh south-easterly breeze; it is not prudent for a sailing vessel to close the land before 10h. a.m. nor after 3h. p.m. It is always necessary to be prepared for the Bora, which, even in fine weather, often comes on suddenly with extreme violence. In the winter, it is always difficult to distinguish the land about the entrance to the gulf in south-easterly, southerly, or south-westerly winds; indeed, in a vessel under sail, it is then sometimes impracticable to enter.

**Current.**—The currents are rapid and uncertain in the Cattaro passages, especially in the entrance. After heavy rains, they attain a speed of 2 to more than 3 miles an hour, and at other times to about half this rate. In the summer there is but little current.

**Signal station.**—On the north-western side of the lighthouse on point d'Ostro is a semaphore tower painted in horizontal white and black bands, by means of which vessels can communicate by the International Code of signals. It is connected with the telegraph system of the Continent.

Plan.  
1,463 [809].

**LIGHTS.—Point d'Ostro.**—From a decagonal tower, adjoining a two-storey dwelling 55 feet high, on the summit of point d'Ostro, on the western side of entrance, is exhibited at an elevation of 263 feet above the sea, a *fixed white* light varied by a *bright flash of four seconds* duration every *half minute*, visible in clear weather from a distance of 23 miles.

Lat. 42° 24' N.  
Long. 18 32 E.

**Rondoni islet.**—From a stone turret in Fort Mamula, Rondoni islet, in the entrance to the gulf, is exhibited at an elevation of 110 feet above the sea, a *fixed red* light, visible 4 miles.

**Telegraph cables.**—Point d'Ostro is connected with Rondoni islet and with Lustica point, on the opposite shore, by cable: Lustica

Plans,  
1,463 [809]  
419 [810].  
Var. 7° W.

point also is connected with two points on the western shore and with Castelnuovo.

**Submarine mining ground.**—The submarine mining ground is bounded by the following limits: On the south by a line from point d'Ostro to Rondoni islet; on the north-west from Castelnuovo to Njivice; on the east from port Rose to Savina convent, westward of Meljine.

**Prohibited anchorages.**—Anchoring and ground fishing is prohibited in the submarine mining area, except in port Rose and port Castelnuovo, and in addition for sailing vessels opposite Njivice.

- (b) In the eastern part of Kumbor strait, in the area included between a line drawn South from Sta. Domenica chapel, and a line drawn South from Banic chapel.
- (c) In Krtole and Kukuljina bays eastward of a line from Casa Verona to Sta. Trinita chapel and thence extended to the southern shore.
- (d) In the northern part of the Catene channel, north of a line drawn from the telegraph tower at Lepetane to Kamenari.
- (e) In the gulf of Cattaro, within the triangular space between Madonna point and the two telegraph towers at Andric and Perasto.
- (f) For anchorage in the southern part of Catene channel, and off the Naval establishments in Teoda bay, except under stress of weather, permission of the Naval Authorities is necessary.
- (g) Vessels must not anchor in the vicinity of any of the telegraph cables.

**Directions for the entrance.**—The entrance to the gulf of Cattaro is about  $1\frac{1}{2}$  miles wide; the shores are inaccessible, rocky, and covered with brushwood. It is so exposed to winds and heavy seas from the southward, that it is not prudent to anchor in the entrance unless necessitated so to do by calms or currents. Rondoni islet is clear of danger, and may be passed on either side. If unavoidably compelled to anchor in the entrance where the general depths are from 20 to 25 fathoms care must be taken to avoid a rocky 7-fathoms bank about 3 cables S.W.  $\frac{1}{2}$  W. from the fort on Lustica point as well as the submarine cables just described.

**In the summer season,** to avoid the frequent calms near Kobila point, it is advisable for a sailing vessel to keep on the eastern side, where the anchor may be dropped, if unable to stem the current. This is also a better position to meet the heavy squalls, which become more easterly than the regular breeze during heavy rains in the mountains. Care should be taken to avoid being set into the bay on the north-western side of the entrance, where there is often a heavy sea and the holding ground is bad. Vessels may find temporary anchorage sheltered from easterly winds in port Zanjca, the bay eastward of Rondoni islet, but, to secure for a Bora, cables should be taken to the shore. On the northern side of Arza point is a large rock with some ruins on it.

**TOPLA BAY,** the western basin, has a central depth of 20 to 23 fathoms and anchorage in its north-western part in 6 or 7 fathoms, mud, about 7 cables from the shore at the head of the bay and a long half mile from Castelnuovo mole. It is easily reached but greatly exposed to winds from seaward and is not a good anchorage even in the fine season. At the head of the bay are the remains of salterns and extensive marshes through which the river Suttarina finds its way to the sea. The head of the bay is bordered by shallow water extending nearly half a mile off-shore.

Lat. 42° 26' N.  
Long. 18 33 E.

Like the entrance, it is surrounded by high barren land of whitish aspect. Generally, if care be taken to enter the gulf with a good breeze—and sailing vessels should not attempt any of the passages without the prospect of carrying a good steady breeze through—Topla bay may be easily reached. Between Kobila and Lustica points, at the inner part of the entrance, the inner and outer currents meet and, with southerly winds, there is often a heavy sea.

**Caution** is particularly required during the last three months of the year, and in January when southerly winds prevail; even when these winds do not reach the entrance, they often send in a sea, aggravated by the current, which in the winter season, sometimes runs here at the rate of more than 3 miles an hour.

**Castelnuovo** is a small town with about 1,500 inhabitants, north-eastward of the entrance, in Topla bay. It is commanded by fort Spagnuolo, on a hill 581 feet high. The land in the neighbourhood on the northern shore is well cultivated, and provisions may be obtained. There is a watering place near the lazaretto. A railway runs from this place to Ragusa.

**Light.**—A *fixed red* light elevated 23 feet above the sea, is exhibited from an iron standard on Castelnuovo South mole, visible in clear weather from a distance of 2 miles.

**Meljine bay.**—The best anchorage in the western basin is in Meljine bay in a depth of 9 to 12 fathoms, mud, about 4 cables south-eastward of the lazaretto. Vessels anchor here and small craft make fast to the shore; and, as the bottom rises considerably and the holding ground is good, there is no risk of being driven ashore by them, although southerly and south-easterly winds occasion a considerable sea.

This anchorage is safe during south-easterly, north-westerly, or westerly winds; the last seldom blow longer than 24 hours. The coast between Castelnuovo and the lazaretto is exposed to sea winds and the anchorage off it is not good; *see* prohibited anchorage, page 252.

There are two mooring buoys in Meljine bay.

**Lights.**—At Meljine, about one mile eastward of Castelnuovo church, a *fixed green* light, elevated 29 feet above the sea, is exhibited from the wall of the lazaretto, and is visible at the distance of 3 miles between the bearings S. 72° E., through east and north, to S. 42° W.

At Zelenica, situated about 1½ miles S. 76° E. from Castelnuovo church, two *fixed red* vertical lights, elevated respectively 16 and 30 feet above the sea, are exhibited from an iron support on the quay; they are visible at a distance of 3 miles when bearing from S. 38° E., through east and north, to N. 38° W. During strong south-easterly winds these lights cannot be shown.

**Port Rose** is a small bay about a mile within Lustica point and opposite Castelnuovo. It is less than 1½ cables across the entrance and has a depth of 6 fathoms, muddy bottom. It is well known to the native mariner as the first place of shelter from southerly winds, and they often anchor here, it being a convenient position for a start outward with the land breeze.

There are two mooring buoys at port Rose.

**Telegraph.**—There is a telegraph station at Port Rose, also at Castelnuovo.

**Kumbor channel** is the connecting channel between Topla and Teodo bays; it is nearly 4 cables wide at the narrowest part with a depth

Plans,  
1,463 [809],  
419 [810].  
Var. 7° W.

Plan on  
419 [810].

Lat. 42° 27' N.  
Long. 18 34 E.

Lat. 42° 25' N.  
Long. 18 33 E.

Lat. 42° 26' N.  
Long. 18 36 E.

Plan on  
419 [810].  
Var. 7° W.

of 20 to 25 fathoms. Vessels should avoid closing the northern shore after passing Kumbor, just westward of which village a mooring buoy is placed, as the shore is bordered by shoal water, especially from Gjenovic point eastward, where a shoal, with about one fathom water, extends nearly  $1\frac{1}{2}$  cables from the shore abreast the village of Gjenovic.

**Beacon.—Light.**—A conical beacon of masonry, 10 feet above the level of the sea, stands in 6 feet water near the edge of the above shoal, with Gjenovic point bearing W.N.W., distance  $2\frac{1}{2}$  cables.

A *fixed red* light (unwatched) is exhibited from the beacon, at an elevation of 13 feet above the sea, and visible in clear weather from a distance of 3 miles. Reported irregular December 1907.

**Coal.**—There is a coaling station at Kumbor, where about 10,000 tons of coal, the property of the Austrian Government, are kept in stock, but foreign vessels are only supplied in cases of necessity.

Plans on  
419 [810].  
1,463 [809].  
Lat. 42° 26' N.  
Long. 18 40 E.

**TEODO BAY**, the middle basin in Cattaro gulf, is in the form of a triangle, with sides extending 4 miles in length, and its depth nowhere exceeds from 20 to 23 fathoms, generally muddy bottom. It is land-locked and well sheltered from Bora gales. Entry is easy in the season of north-westerly winds.

In the winter it is difficult if not impossible of access to a sailing vessel, not only on account of southerly winds, but owing to the strength of the current, which makes it useless to attempt to beat through the Kumbor channel. Westerly winds are of little avail as they seldom retain any strength in the gulf of Cattaro.

The land on the southern side is high, and almost the only dwellings are at the entrance of Krtole bay. On the north-western coast near the shore the ground is low, well cultivated, and abounding in country houses under the shelter of mount Devesile, which rises 2,562 feet above the sea at only  $1\frac{1}{2}$  miles from the shore. The north-eastern coast is similar to the north-western, and is sheltered by the high lands of mount Vermac.

Lat. 42° 24' N.  
Long. 18 42 E.

**Krtole bay**, in the south-eastern part of Teodo bay, is formed by Otok, Stradioto, and Prevlaka islets, which extend from the shore in a north-westerly direction; Otok islet, the westernmost and smallest, has on it a church with a high belfry; Stradioto, the second, is the largest, and is covered with bushes; Prevlaka is between the south-eastern end of Stradioto and the shore, and has a chapel on it.

Krtole bay is on the south-western side of the islets and is about 3 cables wide; it affords the best anchorage in the middle basin in depths of 6 to 10 fathoms for vessels of moderate size in south-easterly or north-westerly winds; and, even in the Bora, as, owing to its distance from the high land, the heavy squalls from the valleys are comparatively little felt.

In Kukuljina bay on the eastern side of Teodo bay good anchorage may be obtained in 8 to 10 fathoms, mud; in south-easterly winds the water is quite smooth, and with winds from the opposite direction the inclination of the bottom is favourable to holding on; caution must, however, be used to avoid too close an approach to this shore from Zeljano bay southward as it is bordered by shoal water.

**Tognola reef**, nearly awash in places, extending 6 cables north-westward from the north end of Stradioto islet, should be carefully avoided. The west extreme of this reef is marked by a stone beacon surmounted by two vertical discs; it is elevated 10 feet above the sea, and is painted in white and red horizontal stripes.

In 1880 the International squadron, consisting of eleven ironclads and six smaller vessels, moored in two lines along the north-western shore of Teodo bay, and reported very favourably of this anchorage as one of the best in the whole gulf in which to ride out a Bora.

Plans on  
1,463 [809].  
419 [810].  
Var. 7° W.

**Piers.**—A wooden pier, about 250 yards long, has been constructed, and a coaling depôt has been established in Zeljano bay, near Lukovic house. There is a landing pier northward of the wooden pier. Immediately north of the latter a small harbour is formed, with a depth of 9 to 15 feet, by the north mole, which juts westward 200 yards and then turns in a south direction for about 300 yards.

Lat. 42° 26' N.  
Long. 18 42 E.

There are four mooring buoys in and to the southward of Zeljano bay, east side of Teodo bay, also other four mooring and warping buoys nearer the mole projecting out from the coal store.

**Lights.—Teodo.**—At the south extreme of the mole of the latter harbour, two vertical *fixed red* lights are exhibited, elevated respectively 19 and 23 feet above the sea, and visible in clear weather from a distance of 2 miles.

At the head of the coaling (south) mole,  $1\frac{1}{2}$  cables southward of the preceding, two vertical *fixed green* lights, elevated 17 and 22 feet respectively above the sea, are exhibited, visible 2 miles, between the bearings S. 33° E., through east and north, to S. 62° W.

**Beacon.**—Close to Zeljano point there is an iron beacon surmounted by a white ball in about 8 feet water marking the edge of the shoal, near which there is a depth of 6 fathoms.

At night the *green* lights on the coaling (south) mole in sight clears Zeljano point shoals.

**CATENE CHANNEL.**—The channel of Le Catene, leading from Teodo bay to the eastern or Cattaro basin, is about  $1\frac{1}{2}$  miles in length with a general depth of from 20 to 22 fathoms, and is less than  $1\frac{1}{2}$  cables wide at the opening into that basin, the narrowest part.

Plan on  
419 [810].

There are no dangers beyond 50 yards from either shore; the water is deep everywhere. In entering the eastern basin, two currents—one from the Cattaro side, the other from Risano bay—at times cause a race which requires a 3-knot breeze for a sailing vessel to pass through.

**Lights.**—A *fixed red* light, elevated 16 feet above the sea, visible in clear weather from a distance of 3 miles, is exhibited from an iron turret on Sta. Domenica point, on the western side of entrance to the Catene channel.

A *fixed green* light, elevated 15 feet above the sea, visible 2 miles, is exhibited from an iron standard on Opatovo point, on the eastern side of entrance.

A *fixed red* light (unwatched), elevated 26 feet above the sea, visible 3 miles, is exhibited from an iron turret on Turka point, at the northern end and western side of the channel.

Lat. 42° 29' N.  
Long. 18 41 E.

**Telegraph cables.**—A telegraph cable crosses the Catene channel from the sandy spit at the southern extreme of the village of Lepetane

Plans on  
1,403 [809],  
419 [810].  
Var. 7° 0' W.

to the opposite shore near the village of Kamenari. Another cable crosses the eastern basin within the entrance, from Andric about half a mile eastward of Madonna point, to the eastern part of the village of Perasto on the northern shore. The positions where the cables are landed are in each case marked by small white pyramidal stone towers.

**The EASTERN BASIN** is larger than Teodo bay and consists of the gulf of Cattaro proper on the east and south, and of Risano bay on the west and north. Although there is good holding ground in nearly every part of this basin in depths of from 10 to 20 fathoms, it is not often resorted to by sailing vessels owing to the difficulty of access under sail, but a considerable number of native vessels winter in its various corners.

The land squalls are heavier here than in the other basins; the high land rising abruptly from near the coast. The south-easterly wind is also dangerous, particularly under the northern shore, which it reaches in extremely violent sudden gusts. Northerly winds, though squally, never blow here in great strength.

Plan on  
1,403 [809].  
Lat. 42° 30' N.  
Long. 18 41 E.

**Risano bay.**—Two small islets, St. Giorgio and Madonna del Scalpello, connected and surrounded by shoal water and each with a chapel on it, lie in the route to this bay, leaving a passage with deep water on either side of them, that on the western side being the wider of the two.

The small town of Risano,—ancient *Rhizenium*,—is in the north-eastern corner of the bay. The inhabitants are given to commercial pursuits and the land in the vicinity is well cultivated, as is also the southern shore; but the western coast, northward of Moringj, is sterile and almost uninhabited.

**Water.**—A cascade, called Sopot by the natives, issues from a cavern near the town. Water is also abundant in the Moringj river opposite Risano; and, again, at a rivulet close to the small town of Orahovac in the northern corner of the gulf of Cattaro, which, however, is reported to be of indifferent quality; and along the shore of Perasto, the whole of the eastern basin being plentifully supplied from the high lands which surround it.

**Perasto.**—The village of Perasto is immediately opposite the Catene channel and is commanded by Fort Sta. Croce.

**Lights.**—Perasto.—A *fixed red* light is exhibited from a wooden post on the principal quay at Perasto, opposite the entrance to Catene channel visible at the distance of 2 miles between the bearings S. 49° E., through east and north, and N. 49° W.

Risano.—During dark nights and when steam vessels are expected, a *fixed red* light, elevated 21 feet above the sea and visible 2 miles, is shown from an iron standard on the molehead at Risano.

Lat. 42° 25' N.  
Long. 18 40 E.

**CATTARO.**—The town of Cattaro, containing about 3,050 inhabitants, is at the south-eastern extreme of the eastern basin or gulf of Cattaro, at the foot of a rocky hill whose summit is separated by a wide valley from the steep mountain range of Montenegro, and is crowned by fort Vermac at 1,588 feet above the sea. Cattaro is surrounded by an old Venetian wall and protected by batteries, but chiefly by fort Vermac. It is about 2½ miles north-westward of mount Lovcen or Sella, 5,770 feet

above the sea, and the highest of the surrounding mountains. Stoliwo and Perzagno villages lie at the foot of mount Vermac on the western side of the gulf and are surrounded by gardens; their inhabitants are all mariners, as are the natives of the gulf generally. Plans on  
1,463 [809],  
419 [810],  
Var. 7° W.

The church of Perzagno is large and conspicuous, standing on the slope of the hill away from the village, whilst that of St. Mateo on the opposite shore is a ruin and difficult to distinguish, but the point below has a large church on it. The hospital at the head of the bay, is a conspicuous building.

Although the inhabitants are mainly of Sclavic origin, the language generally in use here and indeed throughout the whole Dalmatian coast is chiefly Italian.

The frontier of Montenegro is close to Cattaro, to which there is a military road with numerous zig-zags. Cettigni, the capital of that principality, is distant a ride of six hours.

**Supplies.**—Fresh beef is very inferior at Cattaro; but supplies generally are fairly plentiful.

**The port.—Anchorage.**—It is prudent for large vessels arriving off the town of Cattaro to moor; a fair berth is in a depth of 11 fathoms, mud, with St. Elia point N.E. about 2 cables. Shoals extend about 40 yards both from St. Elia and St. Mateo points, also, off the village of Tomic on the eastern shore and from a point about W.S.W. from it on the opposite shore; with these exceptions the coasts of the gulf are steep-to. Lat. 42° 26' N.  
Long. 18 46 E.

Off Cattaro there are two white mooring buoys in deep water to which vessels of war are occasionally permitted to make fast, but they should not be taken by large vessels. The Austrian Lloyd's steamers use these buoys but they usually run alongside the marina to discharge passengers, &c. The water off the town is fresh, and a vessel's bottom, however foul, soon becomes clean.

**Harbour Works.**—The quay at the mouth of the Fiumera is to be extended in a north-west direction; the extreme of the works is marked by a light.

**Lights.—Cattaro.**—Eustachio.—From an iron support on the shore at Eustachio, on the eastern side of the gulf of Cattaro and about  $2\frac{1}{2}$  miles northward of the town of Cattaro, are exhibited two *fixed red* lights placed vertically, elevated respectively 23 feet and 9 feet above the sea, visible at the distance of 2 miles. Lat. 42° 28' N.  
Long. 18 46 E.

Perzagno.—On Shutega point, Perzagno, from an iron standard, a *fixed green* light is exhibited at an elevation of 16 feet above the sea, visible 2 miles.

A light, elevated 12 feet above the sea, and visible 2 miles, is exhibited from an iron standard near the marina head at Cattaro, showing *red* when bearing from N. 69° E., through east, to S. 69° W.; *white* elsewhere.

**DIRECTIONS.**—There is no difficulty in a steam vessel in entering and navigating the several branches of the gulf of Cattaro, and the depth of water is sufficient for all classes of vessels, guarding against the set of the variable currents. In 1880, the International squadron went as far up as Teodo bay, as stated on page 255. Charts,  
2,713 [805],  
2,701 [808].

In a sailing vessel bound to the gulf of Cattaro, it is advisable to make the land from the southward on account of the current, and to steer for mount Lovcen or Sella, to ensure a good position for entering. If the land should be made when steering at right angles to the coast, mount

Plans on  
1,463 [809],  
419 [810].  
Var. 7° W.

Radostak, 4,744 feet high and about 6 miles north-north-eastward from point d'Ostro, is a good mark for the entrance; *see* view B on chart No. 2,713.

During the fine season, if prevented by unfavourable winds from entering the gulf, small vessels anchor close in-shore on any convenient part of the coast; but, except for momentary purposes or in urgent cases, it is better to repair to Traste bay.

**If outward bound** and, having passed Kobilá point, the wind should be south-easterly with a heavy sea, and the current running, which when opposed by that from the gulf, sets towards the bay in the north-western part of the entrance, the vessel should anchor immediately. She would then be in an exposed position but would incur less risk than by attempting to proceed or by endeavouring to return to an inner anchorage, unless with a sufficiently favourable breeze to ensure stemming the out-going current.

If the land wind should be lost before rounding point d'Ostro, it may become necessary to anchor, as it might be impracticable to work out against the coast current and sea breeze.

After passing point d'Ostro, if a vessel should be becalmed before having obtained a sufficient offing, she might be drifted into dangerous proximity with the coast between the point and Ragusa Vecchia. Care should therefore be used to take advantage of the land winds, which occur at all seasons, and to procure a sufficient offing before they are overcome by the sea breeze.

From the foregoing remarks, it will be seen that on leaving the gulf in a sailing vessel during the winter, the strength of the currents often present serious obstacles.

**TRASTE BAY** is about 5 miles south-eastward of the entrance to the gulf of Cattaro, the coast between being steep and irregular but clear of off-lying dangers. Remo point, 2 miles eastward of the north-western point of the bay, is of whitish aspect, and Zukovac point, nearly the same distance south-eastward of the bay, is high and abrupt. The position of Traste bay may be readily recognised, its head being the low isthmus connecting the hilly peninsula, forming the southern side of Teodo bay and the Kumbor channel, with the land south-eastward of it, rising from Traste point to a height of 1,345 feet above the sea at mount Percia Glava, about  $2\frac{1}{2}$  miles from the point.

Traste bay is  $1\frac{1}{2}$  miles wide at the entrance between Kocista and Traste points, and recedes about the same distance, with depths of from 8 to 16 fathoms, sand and shells; but a rocky 6-fathoms patch half a mile E. by N. from Kocista point, the western point of entrance, should be avoided by vessels seeking temporary anchorage here.

The bay is completely open to the southward, but in the south-eastern corner under cover of Traste point, there is a cove with good anchorage in 8 or 9 fathoms, sheltered from the Bora and from all winds. The church of St. Nicolo and the village of Traste are at the head of this cove, and there are several forts on the hills around the bay.

On entering the bay, Traste point should be given a wide berth, as a shoal extends nearly 2 cables off it.

**COAST.—Albanese rock** lies S. by E. distant 2 miles nearly from Traste point, and N.W.  $\frac{1}{2}$  N. 4 cables from Zukovac point; the rock is awash and almost steep-to, but it should be given a wide berth.

**Platamone point** is  $4\frac{3}{4}$  miles south-eastward of Zukovac point; if overtaken by a Bora near the coast between these points, the best

General charts, 2,713 [805], 2,701 [808].

Plan on  
1,463 [809].  
Lat. 42° 22' N.  
Long. 18 41 E.

Lat. 42° 20' N.  
Long. 18 42 E.

Lat. 42° 16' N.  
Long. 18 47 E.

anchorage is close in-shore, off a conical hill 1,007 feet high, on the summit of which is St. Ilia chapel; but, on the cessation of the Bora or the slightest indication of a southerly wind, which latter is often preceded by a heavy swell, vessels should immediately get under way. Steep well-wooded hills rise between the two points and the water is everywhere deep close in-shore.

**Tersteno and Jasi bays.**—Between Platamone point and Budua,  $2\frac{3}{4}$  miles eastward, are the bays of Tersteno and Jasi, separated from each other by Tersteno point; the latter bay affords shelter in moderate weather with easterly or north-easterly winds, but, as it is open to the southward, a vessel should leave at once on any indication of wind from that quarter. The shore of the bay is bordered by shoal water.

A short half mile from the shore of Jasi bay, mount Spas rises to a height of 1,276 feet, and at a distance seaward, has the appearance of an island. It is of pyramidal shape, the steepest side being on the north-west, and on its summit is a monastery; it terminates in Jasi point which separates Jasi bay from Budua.

**Coast.**—Between Budua and Dubovica point, about 8 miles farther south-eastward, the coast is rather bold and steep-to, with the exception of a few rocks here and there skirting the shore.

**PORT BUDUA.**—Between Platamone point and Pavlovici,  $6\frac{1}{2}$  miles south-eastward of it, the coast recedes and forms a bay more than  $2\frac{1}{2}$  miles deep. On the northern shore of the bay is the little walled town of Budua on a small sandy peninsula; and at the town is a telegraph station.

**The islet of St. Nicolo**, about a mile long, nearly a quarter of a mile broad, and 397 feet high, lies with its length in a S.S.E. direction from the town, and with its northern end distant  $4\frac{1}{2}$  cables from Budua but connected with it by a shoal or ridge upon which there is from  $1\frac{3}{4}$  to 3 fathoms water. Another very shallow narrow rocky ridge projects from the same point of the islet in a N.N.E. direction, forming a natural breakwater and reaching the shore at the head of the bay nearly midway between Budua and Zavala point; there is no passage over it even for boats except in fine weather.

Port Budua with from  $3\frac{1}{2}$  to  $4\frac{1}{2}$  fathoms, sand, shells, and mud, is between the town and this last-mentioned ridge. It is sheltered by St. Nicolo islet and also receives considerable protection from the shallow ridges above mentioned. The only passage into the port is over the ridge between St. Nicolo islet and the town in about 13 feet. The south-western side of St. Nicolo islet is cliffy, and rocks extend nearly 2 cables. The church on Zavala point and fort Zavala, north-eastward of St. Nicolo, are in ruins, and only the latter can be recognised.

**Channel.—Buoy.**—A white conical buoy surmounted by a ball lies in about 16 feet water on the shoulder of the ridge extending from Budua towards St. Nicolo islet. In entering the port, pass near the buoy and leave it on the port hand, but no more than about 13 feet water can be depended on in crossing the shoal. Within the port is a mooring buoy about  $1\frac{1}{2}$  cables eastward of the molehead in about  $3\frac{1}{2}$  fathoms.

In the boat channel, with 3 feet water, leading over the easternmost ridge, the steeple of Budua church bears N.W. by W.  $\frac{3}{4}$  W.

**LIGHTS.—St. Nicolo islet.**—From the top of a small dwelling at the south-eastern extreme of St. Nicolo islet is exhibited, at an elevation

Plan.  
1,463 [809].  
Var. 7° W.

Lat. 42° 17' N.  
Long. 18° 49' E.

Plan of port  
Budua on  
1,463 [809].  
Lat. 42° 16' N.  
Long. 18° 50' E.

Plan on  
1,463 [809].  
Var. 7° W.

of 75 feet above the sea, a *fixed white* light visible in clear weather from a distance of 8 miles, between the bearings S. 61° E., through east and north, to S. 74° W.

**Budua mole.**—A small mole projects from the north-eastern part of the town, from an iron standard on which a *fixed red* light is shown, elevated 20 feet above the sea and visible 2 miles.

**Malaluka bay**, eastward of port Budua, affords a clear space of about  $1\frac{1}{4}$  miles square, with a depth of from 9 to 16 fathoms, good holding ground. During summer, large vessels may anchor here, but though sheltered from all other directions it is exposed to southerly winds and sea.

During strong S.E. winds, better shelter will be found midway between Zavala point and a white landmark on St. Nicolo island, marked A.S. (*anchorage sirocco*), in about 8 fathoms.

During the Bora or strong N.E. winds, there is good anchorage westward of Zavala point, in about 7 fathoms, abreast a similar white landmark, marked A.B. (*anchorage bora*).

**Coast.**—St. Stefano is a small village on a little rocky peninsula E. by S.  $\frac{1}{2}$  S.  $1\frac{1}{2}$  miles nearly from the southern point of St. Nicolo islet. Near the shore, between St. Stefano and Dubovica point, may be seen houses and some cultivated patches; the higher grounds are covered with trees. Rather more than a mile southward of St. Stefano is Grossa point,\* rounded and 279 feet high; and  $2\frac{3}{4}$  miles farther on, is Lastua castle and a telegraph station. The coast of Dalmatia terminates about three miles south-eastward of Lastua castle.

\*Lat. 42° 14' N.  
Long. 18 54 E.

Lat. 42° 11' N.  
Long. 18 56 E.

**St. Domenica and Katic rocks.**—Southward of Lastua castle are these two little islets or rocks; the former, nearest the shore and 108 feet high, has on it the ruins of a monastery; the latter islet is 75 feet high. St. Domenica is only 3 cables from the coast, and there is a narrow channel with 6 fathoms water between the reef surrounding the islets and the shallow water bordering the shore. The reef extends nearly a quarter of a mile southward of the islets and is steep-to.

**Spizza bay.**—Nearly  $5\frac{1}{2}$  miles south-eastward of Lastua castle is Crni point, the north-western extreme of Spizza bay; the point is steep-to, bold, and 515 feet high. About  $1\frac{1}{2}$  miles eastward of the point is a battery on high land, and just beyond it the village of Spizza, where good drinking water and a small supply of provisions is obtainable.

There is anchorage in this bay for small vessels with off-shore winds in a depth of 9 fathoms, sand, half way between the village and Rateg point, its south-eastern boundary, but with on-shore winds it is completely exposed. A little more than a mile eastward from the shore of this bay, mount Pettilje rises 2,350 feet above the sea.

Plan of Antivari  
roads on  
1,463 [809].  
Lat. 42° 8' N.  
Long. 19 3 E.  
Var. 6 50 W.

Lat. 42° 6' N.  
Long. 19 5 E.

**ANTIVARI ROADS.**—Following Spizza bay on the south, the shore forms an inward curve round the base of mount Pettilje, the first part being rock and then beach, and terminating in Volovica point which projects north-westward, forming the bay known as Antivari roads. On the high land overlooking it, and below mounts Pettilje and Gorni Gora, is fort Susana, 1,023 feet above the sea.

This part of the coast is backed by high mountainous land, and, between  $2\frac{1}{2}$  and  $4\frac{1}{2}$  miles from the shore, the peaks of mounts Kosa, Rumia, and Lissin rise respectively 3,728 feet, 5,226 feet, and 4,528 feet above the sea. See views of these mountains on chart No. 2,701 and plan No. 1,463.

**The frontier line** separating the Austrian and Montenegrin territories reaches the shore about the middle of the bay.

Plan of Antivari roads on 1,463 [809].  
Var. 6° 50' W.

Vessels entering the roads should give Volovica point a berth of about 3 cables, and may anchor in a depth of 8 or 9 fathoms, mud, good holding ground, with the lighthouse bearing S.W. by W. distant 5 cables.

A rock on the coast, situated about half way between Volovica point and the Custom-house, has been painted white to facilitate anchoring.

Antivari roads being entirely open to the westward, vessels must be prepared to take every precaution on the usual indications of adverse weather from that direction.

By the Treaty of Berlin (1878) no foreign ship-of-war is able to remain at Antivari.

**Mole.**—From a position about 650 yards eastward of Volovica point, a stone pier projecting in a N.N.E. direction, and intended to be 273 yards in length, is being constructed; about 220 yards had been built in June, 1908. Another pier of about the same length will be built out westward from the other side of the bay.

It is expected that the work will be finished in 1909, as well as quay accommodation for the berthing of vessels.

**The town** of Antivari, ancient *Antibarum*, is built on a hill in the form of an amphitheatre and is about 2 miles inland. It is the chief town of a Montenegrin district, contains with Pristane about 7,000 inhabitants, is fortified and surrounded by a wall. It is said to owe its name to its position *opposite Bari* on the Italian coast. From Antivari, Scutari may be reached by a very indifferent bridle road, quite impracticable for any kind of vehicle, the journey taking 10 hours.

**LIGHTS.**—On Volovica point, from an iron standard 24 feet above the ground, attached to the light-keeper's house, is exhibited at an elevation of 131 feet above the sea, a *fixed white* light, visible from a distance of 10 miles. Shallow water extends a cable off from the point.

Lat. 42° 5' N.  
Long. 19° 5' E.

On the Custom-house mole at Pristane, the village on the south side of Antivari bay, a *fixed red* light is exhibited, visible 3 miles.

At the head of the mole at Antivari, a *fixed green* light is shown.

**Railway.**—A narrow gauge railway from the port to Virpazar, on lake Scutari, will be completed by 1909.

**Wireless telegraph station.**—There is a wireless telegraph station on Volovica point, which locality is in connection with the telegraphic system of the country.

**Winds.**—In winter, it does not blow hard from the north-west and the anchorage is sheltered from all off-shore winds and as far round as about S.W. by W.; in that season the strongest winds are off the mountains. In summer, there are hard squalls from the north-west, with thunder and lightning, but they are soon over.

**THE COAST** between Antivari roads and Menders point, about 9 miles to the southward, is slightly indented; here a vessel may anchor if able to reach it when overtaken by a Bora gale, but the shore must be closely approached to arrive at a moderate depth of water. The general coast line of the bay is irregular, with two or three coves, whose projecting points are foul, and off the northern point of Kruci bay, the next but one northward of Menders point, is a little islet and some rocks.

Chart, 2,701 [808].

**Noce bay**, on the northern side of Menders point, has room near the Custom-house for a few small vessels in north-easterly and easterly winds. The land rises immediately over the northern side of this bay to a height of 1,447 feet.

Chart.  
2,701 [808].  
Lat. 41° 57' N.  
Long. 19 9 E.  
Var. 6 50 W.

Coasting vessels anchor in the southern part of the bay, off a rock painted white, situated about  $2\frac{3}{4}$  cables west of the Health office.

**LIGHT.**—On **Menders point**, from a mast 170 yards from the shore and at 33 feet above the sea, is exhibited a *fixed red* light, visible in clear weather from a distance of 6 miles.

On dark nights a *red* light is shown for the Lloyd's steamers, from the Health office in Noce bay.

**The GULF of DRIN** is included between Menders point and the narrow promontory of cape Rodoni S.S.E. distant 26 miles from it. It affords good anchorage all along its shores with off-shore winds; the Bora blows here at times with violence. Care is necessary to keep the lead going when approaching the shore of the gulf as it is bordered all round by shallow water extending some distance off, especially at the mouths of the several rivers.

This gulf is the ancient *Apollonia*, the scene of Cæsar's narrow escape with his fleet. In addition to the Bojana, the Drin, the Matja, and the Jsmi, some minor streams empty themselves into the gulf.

**DULCIGNO ROAD.**—This is an open anchorage 3 miles south-eastward of Menders point, with depths of 10 to 12 fathoms off the walled town of Dulcigno, ancient *Olcinium*, which town is in the form of an amphitheatre and being on rather high land is a good mark from seaward at a distance of 12 or 13 miles.

**Dulcigno** has a population of about 7,200 and some of its buildings are remarkable; it has two high square turrets and five minarets, of which the highest is near the landing place. Dulcigno is 6 hours from Scutari, the road is fair and horses may be obtained.

**The Coast** from Menders point trends east-south-eastward 22 miles to port St. Giovanni di Medua, at the head of the gulf of Drin. Between Menders and Derana points, a distance of about 5 miles, the coast is about 500 feet high, it then diminishes rapidly in height until in the vicinity of St. Giovanni di Medua.

There is anchorage all along this part of the coast from Dulcigno eastward during land winds and the Bora.

**Guri Geranis islet**, 4 miles south-eastward of Dulcigno and nearly a mile from the shore, has 8 fathoms water inshore of it; the islet is 13 feet high, of a light reddish colour, with a sunken rock outside it, and has a depth of 10 or 11 fathoms close to.

**BOJANA RIVER** has its source in lake Scutari, and, with a varying width of from 100 to 150 yards, runs into the sea about 8 miles south-eastward of Dulcigno. Near its mouth it divides into two branches, forming a considerable delta overgrown with rushes. For such vessels as can generally enter (*see* depths, page 263), the river is navigable nearly up to lake Scutari, and vessels of about 150 tons, can go more than half the distance; the natives pole their boats all the way. During heavy rains, the current is very rapid and overflows the banks, and the mouth is subject to considerable change.

The country is thickly peopled between the mouth of the river and Scutari to a distance of 11 or 12 miles on either side. The distance by the river to Scutari is about 24 miles; it has been repeatedly ascended by boats from Her Majesty's ships in former years, and no difficulty or obstacle experienced except the strength of the stream, which under ordinary circumstances is from  $2\frac{1}{2}$  to  $3\frac{1}{2}$  knots. An ordinary whale boat has accomplished the ascent in 12 hours, and a steam pinnace the descent in  $2\frac{1}{2}$  hours.

Lat. 41° 54' N.  
Long. 19 12 E.

Lat. 41° 53' N.  
Long. 19 17 E.

Lat. 41° 51' N.  
Long. 19 22 E.

The Montenegrin boundary is at the village of San Giorgio,  $7\frac{1}{2}$  miles from the entrance; above this, both banks are in Turkish territory.

Chart,  
2,701 [808].  
Var.  $6^{\circ} 40'$  W.

**Depths.**—The depths at the two entrances vary greatly; sometimes one and sometimes the other being the deeper. In June 1905, the south-western entrance was well beaconed and had a depth of from 6 to 7 feet. The south-eastern entrance, with barely 3 feet over the bar, was not used for traffic. The depth in the river itself is reported to be about 12 feet. It is probably from 2 to 3 feet deeper in winter.

**Pilots** for the river may be obtained at Pulej. One is necessary for the last 4 miles to Scutari, and may be had from a barge moored at Oboti.

**Communication.**—Three steamers of about 200 tons (two Austrian and one Italian) call here every week and proceed up the river as far as Oboti.

**Telegraph.**—There are telegraph offices at Pulej and St. Nicolo in connection with Scutari; messages must be translated into Turkish before they can be despatched; delays and inaccuracies are to be expected.

**Pratique.**—There is a pratique office at Pulej, the village on the east bank of the river just inside the entrance, and the Turkish authorities are particular not to allow any communication with the shore, or to permit any boats to proceed up the river until pratique has been obtained.

**Supplies.**—Fresh beef and mutton can be obtained in sufficient quantities to supply two or three large vessels. A supply of good water is procurable from deep wells close to Pulej village.

**SCUTARI.**—The town of Scutari, ancient *Scodra*, named by the Turks, Iscudar, is the capital of the province of Albania and the residence of the governor. It is on the slope of a hill crowned by a fort 2 or 3 miles from the south-eastern end of the lake. It is in communication by telegraph with Pulej at the mouth of the Bojana, and with Durazzo, Valona, Otranto, Corfu, &c.

Lat.  $42^{\circ} 4' N.$   
Long.  $19^{\circ} 31' E.$

H.M.S. *Diana* reported in July 1905, that the town of Scutari was practically destroyed by recent earthquakes, and that the inhabitants were then sleeping in the roads and in the open, as shocks of earthquakes still occurred; the citadel and barracks, which stood on a rock about 400 feet above the plain, had been thrown down.

**Scutari lake**, some 65 feet above sea level, is about 20 miles long and from 3 to 6 miles wide; it is in the middle of a fertile, well-populated plain, and receives the waters of Moraca and of several other rivers which flow from Montenegro and from the mountains eastward. It has abundance of fish; large boats are employed on it, and its navigation, except during heavy floods, is reported to be easy, there being no hidden dangers. There is a railway from Virpazar, at the north-west end of the lake, to Antivari; see page 261.

**Bojana anchorage.**—There is anchorage off the river Bojana with off-shore winds, and a steam vessel with fair power and moderate attention could put to sea in almost any weather. A good summer berth is in a depth of 6 or 7 fathoms,  $1\frac{1}{2}$  miles from the shore, with a white house on the eastern side of the entrance bearing N.N.E.  $\frac{1}{4}$  E.; or in a large vessel, farther out in 9 or 10 fathoms.

Lat.  $41^{\circ} 50' N.$   
Long.  $19^{\circ} 22' E.$

Care is necessary to give the entrance of the river a wide berth, as the bank fronting the delta, with less than 3 fathoms, extends nearly three-quarters of a mile from the shore and is said to be growing seaward. The bank is formed by the stream from the river, but is subject to shifts from time to time, especially during south-easterly gales. The mouth of

Chart,  
2,701 [808].  
Var. 6° 40' W.

the river may be known by the white two-storied house before mentioned, a guard house, and the small chapel of St. Nicolo. The land here is low, well-wooded, and extends perfectly level for some miles inland to the base of the mountains.

Plan of port  
St. Giovanni di  
Medua on  
1,463 [809].  
Lat. 41° 48' N.  
Long. 19 35 E.

**PORT ST. GIOVANNI DI MEDUA.**—In the north-eastern part of the gulf and nearly 11 miles south-eastward of the Bojana river entrance, where the land has again become high, is the little port of St. Giovanni di Medua, or *Chinkin* according to its Turkish name, affording sheltered accommodation for about a dozen small vessels in from 3½ to 4 fathoms water secured to the shore.

The port is a small bay receding about 4 cables northward, and is protected by a shallow bank projecting eastward from St. Giovanni point on its western side; this bank, which is steep-to, is marked by beacons and covers the port from the south.

There is little to indicate the position of the port until a vessel has approached closely to it. It may be known by St. Giovanni point, being the eastern extreme of the only spur of the neighbouring ridge of hills whose base is washed by the sea. This rocky shore is about a mile in length, and its eastern extreme, as before explained, forms the western side of the port; with this exception, the sandy beach extends for miles westward and southward of it.

**Town.**—St. Giovanni di Medua is most unhealthy during the summer months, but the malaria and fever cease by the middle of October. It is said that few escape who visit it during August and September, however short a stay they may make, and the appearance of the people and country tend to confirm this statement.

**Telegraph.**—There is a telegraph station at St. Giovanni di Medua.

**Light.**—From a staff on St. Giovanni point, at an elevation of 59 feet above the sea, is exhibited a *fixed red* light, visible in clear weather from a distance of 6 miles, when bearing from N. 80° E., through north, to N. 28° W.

**ANCHORAGES.**—There is anchorage in St. Giovanni di Medua road in a depth of 11 or 12 fathoms, sand and mud, with St. Giovanni point bearing N.E. by N. distant 1½ miles, and about the same distance from the eastern shore of that name; and although this berth is exposed to the south-west, it is said to be safe, as a gale from this quarter is unknown in this locality, and it is well sheltered from the Bora and Sirocco.

Chart,  
2,701 [808].

**Gulf of Drin.**—There is anchorage in moderate depths, up to 25 fathoms with mud bottom, all over the gulf of Drin in northerly and easterly winds, but the best place is in Rodoni roads, on the northern side of the promontory of that name; here a vessel lies sheltered from south-westerly winds in depths of 12 or 14 fathoms, with the cape bearing West or W. ¼ N. distant 2¼ miles, and about one mile from the southern shore of the bay. Small vessels may go farther in.

**Drin river,** the largest of the four rivers before mentioned, except the Bojana, is navigable by boats as far as Alessio, ancient *Lissus*, a small town on a hill in a fertile plain on the eastern bank. From Alessio, there is a fair road to Scutari, and this is said to be the best place from which to communicate with Scutari.

**Caution.**—From a survey (1899) considerable alterations had taken place in the outline of the coast of Albania between the gulf of Drin and Vojuca point since the survey of 1870.

Chart.  
2,701 [808].  
Lat. 41° 45' N.  
Long. 19 34 E.  
Var. 6 40 W.

Mariners should navigate along this coast with caution.

**CAPE RODONI.**—The promontory which terminates in cape Rodoni, or *Ischin* in Turkish, is narrow, from 500 to 675 feet in height, steep and bare near its extreme, but covered elsewhere with vegetation and trees. It stands up conspicuously from the low adjoining ground northward and southward, stretching out about 5 miles north-westward, and is a good landmark.

Lat. 41° 35' N.  
Long. 19 27 E.

The cape has a lighthouse at its extreme and is bordered on either side by shallow water, which also extends about  $1\frac{1}{2}$  miles north-westward of the cape; it should therefore be given a berth of about 2 miles in rounding, and attention be paid to the lead.

**LIGHT.**—From a white lighthouse 33 yards within the extreme of cape Rodoni, at an elevation of 131 feet above the sea, a *flashing white* light with a period of *ten seconds* is exhibited, which is visible in clear weather from a distance of 16 miles.

**Anchorage** in Rodoni roads, *see* preceding page.

**LALES BAY.**—Cape Pali lies about 11 miles southward from cape Rodoni, the low shore between is a sandy beach and recedes, forming this rather deep bay, with depths of from 7 to 13 fathoms in line between the two points and shallow water all round the shore, especially in the southern part, where it extends off two miles.

Lat. 41° 25' N.  
Long. 19 24 E.

The cape is hilly and covered with trees; it juts out about 2 miles in a north-westerly direction, the extreme being rather lower than near the middle; shallow rocky bottom extends about three-quarters of a mile north-westward from the cape and it should be given a berth.

**Cape Pali road** is on the north-eastern side of the cape; from the shallowness of the water, it affords shelter from south-westerly winds to small craft only. The river Arzen runs into the sea about  $3\frac{1}{2}$  miles north-eastward of cape Pali; other streams also empty themselves in the bay.

In the north-eastern part of Lales bay, temporary anchorage may be obtained during a Bora in 4 to 7 fathoms, mud, at one to 2 miles from the shore.

The head of Durazzo lake approaches the southern shore of the bay within a quarter of a mile, and just within the beach about midway on the eastern shore is a lake  $2\frac{3}{4}$  miles in length.

**DURAZZO CAPE AND LAKE.**—The Coast from cape Pali southward rises to upward of 600 feet in height at about  $1\frac{3}{4}$  miles north of cape Durazzo, and within it is Durazzo lake, 5 miles in length. Cape Durazzo, a high, round, sugar-loaf hill, lies  $6\frac{1}{2}$  miles southward of cape Pali, and the whole of this coast is bordered by a rocky bank extending in places some considerable distance from the shore.

Plan of  
Durazzo bay  
1,590 [811].  
Lat. 41° 18' N.  
Long. 19 26 E.

**Cape Laghi**, 10 miles southward of cape Durazzo, between which is Durazzo bay, is comparatively low and projecting but a short distance; it is covered with brushwood, and has a church on its summit.

**Durazzo and Talbot banks.**—The Durazzo bank, with less than 2 feet water, terminates in  $4\frac{1}{4}$  fathoms at  $1\frac{1}{4}$  miles southward of the cape. Separated from the tail of the Durazzo bank by a distance of about one cable with  $5\frac{1}{2}$  fathoms water, is the Talbot shoal which within the

Plan of Durazzo  
bay, 1,590 [811].  
Var. 6° 40' W.

5-fathoms line, is about  $5\frac{1}{2}$  cables in extent, and on its northern half the depth is only from 2 to 3 fathoms.

**Buoy.**—A conical red buoy in 5 fathoms lies off the south-eastern edge of Talbot shoal, with Durazzo lighthouse bearing N.N.E., distant  $1\frac{3}{4}$  miles. This buoy cannot be depended upon.

**DURAZZO BAY**, situated between capes Durazzo and Laghi, is about 4 miles deep. The capes form the only exceptions to the lowness of the shore on this part of the coast, which is bordered all round by shallow water extending from one to 2 miles off; and in south-westerly and westerly winds, when the weather is thick or hazy, it is difficult to make out the land about the bay, in which there are numerous off-lying shoals and from 25 to 30 fathoms water not more than 3 miles outside the dangers.

**The town** of Durazzo, ancient *Dyrrachium*, is partly on the slope of mount Durazzo and partly in a pretty valley southward of it. It is a fortified and walled town with a population of 5,500, and was the emporium of the commerce of Rome with Greece; it is the chief centre of trade in Albania, and as many as 20 or 30 small vessels are sometimes to be found here.

Lat. 41° 18' N.  
Long. 19° 27' E.

**LIGHT.**—A *fixed* light is exhibited from a mast on a white house near the quay at the south-eastern angle of Durazzo, at an elevation of 52 feet above the sea, which shows *white* when bearing from S. 86° E., through east, to N. 63° E.; *red* from N. 63° E. to N. 13° E.; *white* from N. 13° E. to N. 63° W.; obscured elsewhere. The *white* light is visible in clear weather from a distance of 10 miles, *red* light at 6 miles.

**Directions.—Anchorage.**—The anchorage is inside the Durazzo and Talbot banks and eastward of a linedrawn South from the eastern end of the town, and as far north as convenient, but avoiding the shoals fronting the town. Westerly and south-westerly winds send in a considerable sea.

In approaching Durazzo anchorage, the Sasso Bianco, a white rocky hill 336 feet high (white cliffs) on the eastern shore of the bay, is a good guide from the offing; it should be brought to bear East and steered for until the south-eastern extreme of the town of Durazzo bears N.  $\frac{1}{2}$  E. The Talbot shoal has then been passed, and a course may be steered for the eastern side of the town and a berth taken up as convenient, but according to the vessel's draught of water, the soundings here being all very shallow, from  $4\frac{1}{2}$  to 3 fathoms only. When cape Laghi is obscured and Sasso Bianco cannot be seen, it is not prudent to steer for this anchorage.

In entering the bay at night, a vessel should not approach the light nearer than 3 miles until having passed from the *red* sector shown over Talbot shoal, to the inner white sector of light bearing westward of North; then haul up north for the anchorage. The lead should always be kept going, but it is not advisable to enter without local knowledge.

Coming from the southward at night, Durazzo light, showing *red*, may be steered for when bearing eastward of N.E. by N., which leads well clear to the westward of Selada banks; thence as above.

The Kavaja and Dartsch rivers empty themselves in the south-eastern part of Durazzo bay.

**Selada banks.**—From cape Laghi for a distance of 4 miles northward and more than  $2\frac{1}{2}$  miles from the shore of the south-eastern part of Durazzo bay, the whole space is shallow and dotted with rocky patches with as little as 2 to 9 feet water. The outer chain of these dangers runs

nearly north from cape Laghi, and the Selada banks at their north-western extreme, lie north  $3\frac{1}{4}$  miles from the cape; from the shoalest spot on the Selada,  $1\frac{1}{2}$  fathoms, the church on the brow of the hill near Barbaut point bears S.E.; and Robit hill, 180 feet high, a short half mile in from the beach, E. by N.  $\frac{1}{4}$  N.

These banks should not be approached within a less depth than 25 fathoms; and at night, as stated with directions for Durazzo.

**Buoy.**—A conical red buoy, in a depth of 6 fathoms, lies nearly 2 cables westward of the outer edge of Selada banks, with Calaja church, S.  $\frac{1}{2}$  E., distant nearly  $3\frac{1}{2}$  miles. This buoy cannot be depended on.

**COAST.**—From cape Laghi\* to cape Treporti, Valona bay, about 40 miles farther southward, there are no remarkable objects by which positions may be identified. The shore is one uninterrupted sandy beach with numerous small sandhills, and behind it is a desert plain intersected by marshes and lakes as far as the hills in the interior. The coast affords no shelter and is everywhere bordered by shallow water, the 5-fathoms line of soundings being in places more than 2 miles from the shore.

Between these capes, three rivers run into the sea, viz., the Skumbi, the Semeni, and the Vojuca. The mouth of the Skumbi is 8 miles southward of cape Laghi. The Semeni mouth is about the same distance farther on; the source of this river is in mount Tomor and formerly, after an irregular course through the plain, its outlet was 6 miles further south, where it had formed Samana point projecting upwards of 3 miles beyond the line of coast. The Vojuca,† whose source is at the foot of mount Pindo, reaches the sea about 8 miles southward of the Samana point; its former mouth was  $3\frac{1}{2}$  miles further south.

The mouths of these rivers are all subject to great alterations; and as the alluvium deposit around their mouths causes the water to be shallow for some distance off, and the shallows constantly to increase in extent, great care is necessary when navigating in their vicinity. See caution, page 265.

**LIGHT.**—**Samana point.**—On the low extreme of Samana point, from an iron standard on dwelling, are exhibited at an elevation of 46 feet (higher light) above the sea, *two fixed white lights*, placed *vertically*, visible in clear weather from a distance of 10 miles.

**Cape Treporti**, the north-east limit of Valona bay, is not a very prominent point, but being a mixture of rocks and earthy matter 94 feet high, it forms some contrast with the general aspect of this low sandy part of the Albanian coast. It is skirted by rocks which extend about three quarters of a cable off-shore, and from the Vojuca southward, the 5-fathoms line of soundings is from 2 miles off the coast in the northern part to one mile near the cape.

**SASENO ISLAND**, off the entrance of Valona bay, lies 3 miles northward of cape Linguetta, the north-west limit of the bay, and  $4\frac{1}{2}$  miles from the nearest part of the mainland. The island is  $2\frac{1}{2}$  miles in length, steep-sided, and 1,087 feet high; it has two conical hills, which, at a distance, give it the appearance of two islands; its sea face has several caves and clefts in the rocks, the abode of pigeons. It is uninhabited, except occasionally by shepherds, who find some little pasture for their flocks.

There is temporary anchorage off St. Nicolo bay, on the north-eastern side of the island; the holding ground here is good but sheltered only from southerly and westerly winds.

Plan,  
1,590 [811].  
Lat.  $41^{\circ} 12' N.$   
Long.  $19^{\circ} 26' E.$   
Var. 6 40 W.

\*Lat.  $41^{\circ} 9' N.$   
Long.  $19^{\circ} 26' E.$   
Chart,  
2,701 [808].

†Lat.  $40^{\circ} 39' N.$   
Long.  $19^{\circ} 20' E.$

Lat.  $40^{\circ} 47' N.$   
Long.  $19^{\circ} 20' E.$

Plan of Valona  
bay on  
1,589 [812].  
Lat.  $40^{\circ} 30' N.$   
Long.  $19^{\circ} 25' E.$

Plan of Valona  
bay on  
1.589 [812].  
Lat. 40° 30' N.  
Long. 19 16 E.  
Var. 6° 40' W.

**LIGHT.**—On the north-western part of Saseno island, in approach to Valona bay, is a stone lighthouse from which is exhibited at an elevation of 650 feet above the sea, a *white* light, showing a *flash* every *minute*, eclipses intervening, visible in clear weather from a distance of 25 miles when bearing from S. 24° W., through south and east, to N. 13° W. When southward of cape Linguetta, however, vessels bound northward from Corfu channel do not sight this light until it opens of the cape bearing N. 4° W.

**Telegraph cable.**—A telegraph cable leaving the shore of Valona bay at the small white telegraph house, about 1½ miles westward of the town of Valona, passes in a westerly direction through the channel between cape Linguetta and Saseno island, and thence direct for Otranto.

**VALONA BAY.**—This spacious bay is comprised between capes Treporti and Linguetta; it is about 5 miles wide at the entrance with depths of 20 to 10 fathoms for about a mile eastward of, thence shoaling towards Treporti. The bay within is about 9 miles in length, with general depths of 20 to 28 fathoms. For some distance southward of cape Treporti, the coast is low and sandy, with shoal water extending over a mile off-shore, and to be cautiously approached, as the shoal water has been reported to be still extending. Farther south, the coast is backed by hills of moderate height.

The shore around port Dukati, the head of the bay, is low, and just within it is Paschiliman lake or sea, in the vicinity of which the ground is marshy. The south-western side is high and almost precipitous; the land rising at mount San Vasilio 2,750 feet above the sea and terminating northward in Garlovez point and cape Linguetta.

Its position near the entrance of the Adriatic gives importance to the bay as a place for sailing vessels to make for if overtaken by a south-westerly gale on entering, or by south-easterly or easterly winds on quitting this sea. *See* view on plan.

**Anchorage.**—Vessels visiting the bay in the summer for a short stay generally anchor between the Skala or landing place for Valona on the north-eastern side of the bay, and the lighthouse on Pelasgia point, in a depth of 10 to 13 fathoms, mud and weed. North-westerly winds send in a heavy sea at this anchorage and the Bora is severely felt. Those intending to remain longer should proceed to port Dukati the head of the bay, where there is shelter from all winds; the best anchorage is said to be about 6 cables north-west of Nisvoro river entrance, in a depth of 16 fathoms, stiff mud. Raguseo cove, an indentation in the western side of the bay, is well sheltered on all sides with a depth of 10 to 12 fathoms. Port Dukati is a quarantine anchorage, and probably permission is necessary to anchor here.

**The town of Valona,** ancient *Aulon*, is at the foot of a cultivated hill a long mile from the Skala. The hills south-eastward, on one of which the castle of Kanina stands very conspicuously, are thickly covered with olive trees. It was formerly populous but now contains only about 5,000 inhabitants. There is but little trade; salt is the chief produce. The arms formerly manufactured here were held in high esteem.

Two small streams, one on the western side of the bay and the Nisvoro at its head, afford facilities for watering; the latter stream abounds in fine trout. There is good seining in port Dukati.

There is good shooting to be had in Paschiliman lake, but the natives in this locality are untrustworthy. Officers should never land alone, and a Zapiti or Turkish guard should always be obtained (by permission at Valona) for fishing or shooting parties.

Plan on  
1,589 [812].  
Lat. 40° 25' N.  
Long. 19 30 E.  
Var. 6° 40' W.

**LIGHT.**—On *Pelasia* point, nearly  $1\frac{1}{2}$  miles southward of the Skala, is exhibited from a window in a small white dwelling with red roof, at an elevation of 82 feet above the sea, a *fixed red* light, visible in clear weather from a distance of 6 miles between the bearings of S. 3° E., through east, to N. 40° E.

**Buoy.**—There is an iron buoy, painted white, in a depth of 5 fathoms off the landing place at Skala. Reported by H.M.S. *Barham* not in position, November 27th, 1907.

**Directions.**—Cape Linguetta and Saseno island with its lighthouse are easily recognised; the cape is a continuation from the southward of the coast range of mountains, and at mount San Vasilio, about 2 miles from its termination, is, as previously stated, 2,750 feet high. *See* view on plan.

When making the land from the north-westward, until Saseno island is seen, a course should be steered for the high mountains of the interior, which are covered with perpetual snow. In passing the Vojuca river and cape Treporti, the coast should not be closely approached on account of the shallow water which borders it, and the lead should be kept going; the current, as frequently remarked, sets to the northward; *see* caution, page 265.

**The southern** channel, between cape Linguetta and Saseno, is  $2\frac{1}{2}$  miles wide, and deep, but, in entering the bay by it, the north-easterly set of the current through the passage should be borne in mind, though it is not very strong except during south-easterly winds, when it is advisable in a sailing vessel to borrow rather upon the Linguetta side. During these winds, a good look-out must be kept for violent squalls from the high lands in the neighbourhood.

The telegraph cable is laid in this channel, and anchoring must not be taken in its vicinity.

---

General chart, 2,701 [808].

## CHAPTER X.

## COAST OF ALBANIA.—CORFU AND ITS ADJACENT ISLANDS.

Chart,  
2,701 [808].

Lat. 40° 25' N.  
Long. 19 18 E.  
to  
Lat. 38° 56' N.  
Long. 20 45 E.

**General remarks.**—This chapter contains the description of the coast of the Turkish province of Epirus, being that part of Albania beginning where the coast approaches nearest to that of Italy at the entrance of the Adriatic, together with Corfu, the northernmost of the Ionian islands, and its adjacent islands, now an integral part of the Kingdom of Greece. The Albanian seaboard southward from cape Linguetta to the gulf of Prevesa is, in a straight line, about 115 miles. It generally presents to the eye a beautiful aspect, lofty ranges of mountains and hills being separated by fertile valleys and plains. There are but few villages on the coast, and the population is scanty.

**WINDS.**—During summer, north-westerly winds are most prevalent, but in winter those from the south-eastward. In settled summer weather, when the barometer is high, and often in winter, land and sea breezes prevail. The land wind blows from the mountains through the valleys and reaches a longer or shorter distance from the coast according to the season, occasionally, but very rarely, 20 miles, though usually not beyond 10 miles. This wind is light, and in Epirus blows from North to N.E.; in the gulfs of Patras and Corinth from N.E. to East; on the coast of Arcadia, from North to N.E.; and, on the southern coast of the Morea, out of the gulfs.

It commences to blow two or three hours after sunset and increases in force until after midnight when it decreases, falls calm at sunrise, freshens again with the rising of the sun, veering some points eastward, until about 9h. a.m. after which it dies away, and is succeeded by the sea breeze.

**The Imbatto** or sea breeze sets in between W.S.W. and N.W. generally about 10h. a.m. and at times an hour or two earlier, but barely so late as noon. It increases in strength in the first two or three hours, attaining its maximum about 3h. p.m. when it blows fresh and then gradually decreases in force and dies away an hour or two after sunset. This alternate land and sea breeze renders the climate of Ionia healthy, and the sea breeze becomes refreshing during the hours of the greatest heat.

The prevailing wind in the offing in summer is from between W.S.W. and N.W., *see* page 10; it is general during the months of July and August, producing a clear sky and dry atmosphere in Greece, and varies in direction during the 24 hours, veering southward of its normal direction during the forenoon, and then by degrees to the northward of it, where it remains steady during the night. When bound westward, advantage should be taken of this changing direction of the wind.

In the summer, there are at times passing storms of but short duration, perhaps lasting a couple of hours; they are somewhat violent, and, in the inner channels, are foretold by large black clouds gathering in the interior valleys of the islands and bursting in dangerous squalls over the narrow seas, accompanied by rain or hail so heavy as to shut out all view of the neighbouring land. Should the sky therefore be threatening, with slight oscillations of the barometer, caution becomes necessary.

At night, the approach of a fresh breeze may be *heard*.

**The Tarantata.**—As in winter during two or three days, so also in summer for 24 hours, a strong breeze from the N.W. blows in the eastern part of the Ionian sea; it is called the *Tarantata* because it comes from the direction of the gulf of Taranto. These strong winds or gales are of such force that small craft have to bear up before them.

**The Sirocco,** or south-easterly wind, predominates in November and December, and, in February and March, after an interval of a month, again sets in. Its leading features are the same as in the Adriatic, *see* page 14; it is preceded by the falling of the barometer, by a mild close atmosphere, objects appearing above their natural position, by less wind, and by dark clouds on the summits of the land. It sets in with heavy clouds, a thick atmosphere, rain, and much sea.

During August, and at times also during July, this wind gives place to the dry Sirocco, a moderate wind without rain, which, blowing from Africa, at this season, completely gains the ascendancy and causes the heat to be very trying. This Sirocco is more easterly during the morning, more southerly in the afternoon, and at times, during the night veers to S.W.; its force in the day time is then always greater than at night.

The Sirocco each year blows partially during an entire month, and after a brief period of calm, blows again with its usual force for another 14 days.

In winter, with ordinary weather and north-easterly winds in the Adriatic and Archipelago, the mountains of Epirus and Greece are usually covered with snow, and, at times, the plains at their base, where it remains for several days, the atmosphere being thick, the cold intense, and the weather stormy round the southern coast of the Morea and at the entrance of the Archipelago, with a heavy sea southward of Cerigo.

**CURRENTS.**—A general current sets from the Archipelago and along the coast of Greece towards and into the Adriatic; in settled weather, its rate is about three-quarters of a mile an hour, though in the channels of the Ionian islands, from local causes there may be a divergence from this rule. It decreases in strength in proportion to the distance from the land, increases in velocity with south-easterly winds, and still more with strong westerly winds. *See* page 17.

**ASPECT.**—The high mountains of Albania and Greece are visible from seaward at a great distance; and, when coming from the westward,

Chart, 1,800 [815]. there is no position from whence, in fine weather, land cannot be sighted at a distance of more than 50 miles from the coast. The mountains of Cika, in Albania, are seen when south-westward of cape Santa Maria di Leuca, before even that cape itself can be distinguished. Mount Nero,\* 5,218 feet, the highest mount in Cephalonia, is also visible at a distance of 80 miles, and is usually the first land sighted from the westward. Vessels on a more southern parallel will sight mount St. Elias or Makryno rising 7,900 feet above the sea about 7 miles from the eastern shore of the gulf of Kalamata.

\*Lat. 38° 8' N.  
Long. 20 41 E.

The aspect of the country as viewed from the Ionian sea on a clear day is very imposing; the mountains in all variety of forms, pyramidical, cut, and scarped in a greater or less degree, with bold slopes and well-defined outline, alter in appearance with every change of position.

**Caution.**—As the buoys marking the shoals in the Ionian sea are often out of position and at times gone altogether, and as the lights are in some cases defective, navigators are cautioned to be on their guard when in these (or in any other) waters.

**THE COAST** from cape Linguetta, page 269, to port Palermo, a distance of about 32 miles, is almost inaccessible and mostly precipitous. It is the sea front of a high range of serrated mountains culminating in mount Cika,\* 6,644 feet above the sea and only 3 miles inland. Along this extent of coast there are only two or three small coves but no shelter whatever, and it is and ever has been dreaded as a lee shore by small sailing craft, south-westerly gales blowing directly on it; the current, however, sets almost constantly north-westward along the land.

**Strade Bianche** is an excellent landmark; it is a remarkably conspicuous white watercourse or sandy bed of a great torrent, which, descending from the Cika mountains at a steep inclination, presents the appearance many miles seaward of a broad white patch; hence the name. It approaches the sea about 3 miles south-westward of mount Cika, which, with Kiore, another almost equally high peak just north-westward of it, is visible in clear weather from a distance of 75 miles.

**Port Palermo**, ancient *Panormus*, is a bay with two arms on the western side of a high ridge of land projecting southward more than half a mile and sloping gradually towards Kavadoni point, its extreme; it is sheltered on the south-eastern side by an elevated peninsula terminating in Palermo point and is open south-westward.

The bay is divided by a point facing the entrance, on which is St. Nicolo fort, with a few houses in the rear. The northern part, Armareda bay, has depths of from 15 to 35 fathoms, muddy bottom, and is sheltered against all but south-westerly winds. The south-eastern part, Cala Kaka, which contains Panorma and Sinikol coves, has rather less depth.

The prevailing wind should be considered in the choice of one of these anchorages; the shelter is good, but the bottom deepens so rapidly off shore that anchors often drag in the Bora which frequently blows here in the winter. The bottom is rocky in various parts of the bay.

There is no difficulty in distinguishing Palermo. Its position with reference to Corfu and Merlera island, and to the high land 3 miles eastward of the port on which stands Fort Borsi or Bhars, a ruin overlooking St. Demetrio church, are ample indications. Near Fort Borsi is the small

Chart,  
2,701 [808].  
Var. 6° 40' W.

\*Lat. 40° 12' N.  
Long. 19 39 E.

Lat. 40° 9' N.  
Long. 19 36 E.

Plan of port  
Palermo on  
1,589 [812].  
Lat. 40° 3' N.  
Long. 19 48 E.

Chart,  
2,701 [808].

Lat. 40° 4' N.  
Long. 19 52 E.

town of Kiaparo containing about 400 houses, a minaret, and surrounded by a ruined wall; its inhabitants are mostly Turks. The shore on the eastern side of the entrance should not be too closely approached as it is skirted by one or two rocks awash.

Chart, 2,701 [808].  
Var. 6° 30' W.

**Supplies.**—Beef and mutton may be readily obtained, but vessels seldom touch here. It is through this port that the produce of the high lands are exported; olives, maize, gall-nuts, and wood are exchanged chiefly for arms.

**Cape Kiephali.**—Eastward of port Palermo is Grava or St. Demetrio bay, with the little church of the latter name, overlooked by the ruins of Fort Borsi as just described. Cape Kiephali, about 10½ miles south-eastward from port Palermo, is a round projecting headland 489 feet high, covered with stunted trees and bushes; it is steep-to. There is nothing remarkable about the intervening coast which recedes, forming an indentation about 2 miles deep. The water all along is deep at a short half mile from the shore, which is backed by high mountainous land.

Chart, 206 [816].  
Lat. 39° 54' N.  
Long. 19° 55' E.

**Santa Quaranta bay**, about 5 miles south-eastward of cape Kiephali and 4 miles north-eastward of the entrance to the North channel, Corfu, is about 1½ miles wide and recedes 7 cables. It is sheltered from all but westerly winds, to which it is quite open, and is capacious and fit for vessels of any size.

Lat. 39° 51' N.  
Long. 20° 1' E.

Large vessels anchor near the middle, in depths of from 15 to 17 fathoms, mud and sand; small craft find shelter in the northern part nearly abreast some dwellings not far from the Custom-house, which is near the beach and the ruins of an extensive fortress. The village of Lykursi on a high conical hill facing the centre of the bay is very conspicuous.

Quaranta rock, a shoal about 3½ cables in length east and west, with one to 2 fathoms water upon it and steep-to, lies a quarter of a mile southward of the northern point of the bay; and more than a mile W.N.W. from this point there is a 7-fathoms patch, with depths of 22 fathoms between it and the land.

Santa Quaranta has regular postal communication with Janina, and with Corfu by the Austrian Lloyd's steamers.

**Directions.**—Cape Kiephali is a guide to the position of Santa Quaranta bay. Vessels hugging the northern point of the bay in a northerly wind must beware of the rocky shoal lying off it. Vessels of less than 6 feet draught, pass between the shoal and the point, keeping close to the latter.

**Coast.**—From Santa Quaranta bay, the coast, generally rocky and bold, trends southward, and at the distance of about 3 miles is the monastery of St. Georgio standing on a pleasant-looking hill 354 feet high. The monastery is at the north-western angle of Butrinto lake, which is separated from the sea by an irregular piece of land from 3 cables to 2½ miles in breadth. At 1½ miles further on is a bay and in its southern part are the four small islets of Tetranisi. Vessels occasionally anchor on the southern side of these islets in a depth of 9 or 10 fathoms, sand; the shelter is very good in easterly or southerly winds but the soundings are irregular.

**CAPE SCALA** is about 1½ miles south-westward of the Tetranisi islets; the land between is about 500 feet high, and, with the opposite coast of Corfu, forms the narrowest part of the North channel of Corfu.

Plan of Butrinto bay on 1,455 [818].  
Lat. 39° 45' N.  
Long. 19° 59' E.

Plan of  
Butrinto bay, on  
1,455 [818].  
Var. 6° 30' W.  
Lat. 39° 43' N.  
Long. 20 0 E.

From here the town of Corfu, with its magnificent surrounding panorama, may be seen.

**Butrinto bay**, southward of cape Scala, is about a mile wide and recedes nearly three-quarters of a mile to a low broken shore.

There is anchorage in the centre of the bay in a depth of 14 to 16 fathoms, stiff clay, with the point just southward of Cape Scala on with the eastern extreme of Corfu bearing N. by W.  $\frac{1}{2}$  W., and a square tower on a high spur open northward of the ruined fort of Votemi, in the middle of a marsh, N.E. by E. This is considered the best anchorage along the coast, but care should be taken not to approach the shore too closely as the water shoals suddenly from 12 fathoms.

The eastern extreme of Corfu should be kept open of the land about cape Scala to avoid the mud-bank off the Butrinto river; this bank extends some distance off-shore all round the bay and is formed principally by deposit from the Katito river.

Lat. 39° 47' N.  
Long. 20 3 E.

**Butrinto lake**.—This fine sheet of water is  $3\frac{1}{2}$  miles in length and about  $1\frac{1}{2}$  miles in breadth, with depths of 10 to 12 feet all over it; the northern and southern shores are marshy, but the eastern and western shores rise is thickly-wooded limestone hills, and, from the northern end, an extensive wooded plain extends to the foot of the high mountain range near Santa Quaranta. The lake abounds with fish, and towards the northern part the water is fresh; it communicates with the sea by the Butrinto river at the south-western corner.

Another small fresh water lake, named Risa, near the south-eastern corner of the Butrinto lake, communicates with it by a narrow canal and is supplied by copious springs.

After entering the Butrinto river, on the northern side is the salt water lake Almura which is entered by a narrow channel opposite the ruins of fort Votemi; the river here is about 20 yards wide, and  $1\frac{1}{4}$  miles farther up on the northern bank, at the opening into Butrinto lake, are the ruins of an extensive fort with several square towers, standing on the summit of a rocky peak. An abundance of game is found in the neighbourhood. Butrinto, Katito, and Livitazza are the best grounds for snipe, woodcock, and wildfowl of all kinds; Ftelia and Pagania for deer and wild boar.

Chart, 206 [816].  
Lat. 39° 41' N.  
Long. 20 0 E.

**Cape Stilo**, 4 miles southward of cape Scala, is low and salient, but the land about 2 miles within it rises to 883 feet in height; the coast between Butrinto bay and the cape is high, with deep water close to. The islet of Stilo, about 2 cables in circumference and 270 feet high, is about a cable from the shore south-eastward of the cape, with 4 fathoms water between it and the shore.

Port Ftelia, a short mile eastward of Stilo islet, is an irregular inlet open to the south and about 3 cables wide at the entrance. An islet lies on its western side, and within it, on the north, there is a depth of from 3 to 7 fathoms; eastward of the islet there is 11 fathoms. Small coasting craft occasionally seek shelter here and either anchor northward of the islet or in the long creek extending eastward from it, in 9 or 10 fathoms.

Lat. 39° 40' N.  
Long. 20 4 E.

**Kotarto rock**, 3 cables in diameter, with 3 fathoms water, and from 26 to 34 fathoms around, lies nearly three-quarters of a mile from the shore,  $2\frac{3}{4}$  miles eastward of Stilo islet, and  $1\frac{3}{4}$  miles from the southern point of entrance to Pagania. The remarkable cone, 377 feet high, on the coast  $1\frac{1}{2}$  miles south-eastward of the south extreme of Pagania peninsula, kept open and bearing S.E. by E.  $\frac{3}{4}$  E. leads southward of the shoal.

**Paganía.**—This little port is 5 miles E.S.E. of cape Stilo; it is formed by a small peninsula 270 feet high, projecting first at a right angle and then trending parallel with the coast, the sea face of this latter part being about  $1\frac{1}{4}$  miles in length. Plan of port Paganía on chart, 206 [816].  
Lat.  $39^{\circ} 40'$  N.  
Long.  $20^{\circ} 6'$  E.  
Var. 6 30 W.

The entrance is open to the westward,  $2\frac{3}{4}$  cables wide, with 26 fathoms water in mid-channel; the port runs in E.S.E. about 6 cables and then trends S.S.W. nearly 4 cables; this inner part is land-locked and upwards of a cable wide but narrowing close up to the head; it has from 5 to 3 fathoms water and from  $1\frac{1}{2}$  to one fathom in the narrow part at the head. It is but little frequented except for sporting purposes, there being no fresh water and no village.

Vessels anchoring here should run hawsers to the shore, as the bottom, although mud, is not good.

**Hilda bay.**—On the eastern side of Paganía peninsula is a semi-circular bay open to the south, nearly three-quarters of a mile deep and of the same width. On the western side of the bay are the two Hilda islets. There is a depth of from 14 to 17 fathoms in the bay and it is occasionally visited by small vessels. Chart, 206 [816].

**Saiada bay.**—The remarkable cone before mentioned is the northern limit of Saiada bay. Its southern limit is near the mouth of the northern branch of the Kalamo river, which enters the sea on the northern side of mount Mavronoros, a forked mountain with its northern summit 1,675 feet high and less than a mile from the sea. Lat.  $39^{\circ} 37'$  N.  
Long.  $20^{\circ} 10'$  E.

The bay is semicircular and open westward; it is about 2 miles wide, its northern coast high, and south-eastern coast low; the northern shore is bordered by a bank which increases in width round the south-eastern side of the bay, where the shallow ground extending northward considerably contracts the area of deep water, the 5-fathoms line of soundings being only about  $1\frac{1}{4}$  miles from the northern point.

In entering, keep on the northern shore and anchor as convenient with the Custom house at the Scala bearing E.  $\frac{1}{2}$  S. in depths of from 12 to 4 fathoms, mud.

The village of Saiada is at the foot of the hills at the north-eastern angle of the bay.

**Supplies.**—Excellent water may be obtained from a spring which runs into the sea a mile westward of the Scala or landing place. Fresh meat can be had in small quantities but no vegetables. Trade is very limited.

**Kalamo river. — Bacchante flats.**—The Kalamo river, ancient *Thyamis*, empties itself by two mouths separating about  $2\frac{1}{4}$  miles inland, one branch runs into the sea northward of mount Mavronoros; the other, by an irregular course round its eastern base,  $3\frac{1}{2}$  miles farther southward. Lat.  $39^{\circ} 34'$  N.  
Long.  $20^{\circ} 7'$  E.

The Bacchante flats are the continuation southward of the shallow bank bordering the low shore of Saiada bay, and, fronting the mouths of the Kalamo and the base of mount Mavronoros, they terminate at port Livitazza, of which they form the northern boundary. This bank extends into the Corfu channel  $2\frac{3}{4}$  miles from the shore under mount Mavronoros, and has evidently been formed by the mud and débris brought down by the Kalamo; the edge of the bank is steep-to, the water shoaling at places from 14 to 2 fathoms in a very short distance.

The white houses of Murzo village open of Prasudi island S.S.E.  $\frac{3}{8}$  E. lead westward of the flats.

**Livitazza harbour.**—The wooded peninsula of this name south-eastward of the Kalamo, is  $1\frac{1}{2}$  miles in extent east and west, 286 feet high, and united to the mainland by a narrow sandy neck. Its northern side Plan of port Livitazza, on chart, 1,455 [818].  
Lat.  $39^{\circ} 31'$  N.  
Long.  $20^{\circ} 10'$  E.

Plan of port  
Livitazza, on  
1,455 [818].  
Var. 6° 20' W.

forms, with the shallow coast bank southward of the Kalamo, the port or harbour of Livitazza which is open to the west and runs in about a mile.

The entrance is somewhat deceptive and the interior appears larger than it really is, the northern shore being low and forming a deep bight northward, but the channel and available space is narrowed by the shoal water extending from that shore, and the channel is along by the high land of the peninsula, carrying from 7 to 11 fathoms water; it should be entered with great care and discretion. A vessel may anchor in depths of 11 to 9 fathoms good holding ground.

The port has three bays on the southern side, but in the centre of the second (middle bay) is the best and almost land-locked anchorage in 9 fathoms, mud. Small craft load with firewood in the third or inner bay. A large extent of swampy ground, with two arid hills, exists on the north and east, preventing communication with the interior.

There is a great scarcity of fresh water, the river Kalamo being brackish for a considerable distance from its mouth.

Chart, 206 [816].  
Lat. 39° 30' N.  
Long. 20 10 E.

**Prasudi island** is oval in form, about 4 cables in extent, 100 feet high and covered with vegetation. It lies one mile westward of the southern extreme of the Livitazza peninsula, and is a guide for the navigation of the Corfu channel and a mark for clearing the Bacchante flats. A sunken rock lies close to its south-western side, elsewhere it is nearly steep-to; between it and the peninsula there is a reef of rocks above water.

Plan of port  
Gomenizza on  
chart, 206 [816].  
Lat. 39° 29' N.  
Long. 20 16 E.

**PORT GOMENIZZA.**—Following the Livitazza peninsula, the coast south-eastward forms a fine sandy bay where the Turkish fleet occasionally used to anchor, in a depth of 7 or 8 fathoms, sand. In continuation of the neck of sand uniting Livitazza peninsula with the mainland, the low sandy shore trends eastwards to a tongue projecting 7 cables southward and terminating 3 miles eastward of Prasudi island in Drepano point, the northern point of entrance to Gomenizza.

At 7 cables south-westward of Drepano point is the little islet of Aio Nisi, 74 feet high, close to the western extreme of a promontory 1,100 feet high which projects 2 miles in a north-westerly direction; a long half mile within the islet is cape Kudromurto, a wooded bluff and the northern extreme of the promontory.

**The entrance** to Gomenizza is between Aio Nisi islet and cape Kudromurto on the south, and Drepano point on the north, and is about  $4\frac{1}{2}$  cables wide. Shallow water surrounds Drepano point, and extends across the entrance to Aio Nisi islet, forming a sandy bar with only  $2\frac{1}{4}$  fathoms in the best water.

Within the entrance, the port opens out into a nearly oval basin about  $2\frac{1}{2}$  miles in extent in a north and south direction and  $1\frac{1}{4}$  miles wide. A large portion of the north-western part is shallow, but the eastern and southern parts have depths of from 12 to 14 fathoms over a level mud bottom.

The village of Grava and the Custom-house are on the eastern shore, a fortress in ruins stands on a hill in the rear, and to the south-east is a fine cultivated plain. A few bullocks and sheep may be purchased and small quantities of fresh water can be procured from a well.

**Directions.**—To cross the bar, bring an isolated pinnacle peak 1,871 feet high, about  $4\frac{1}{2}$  miles inland from Aio Nisi, on with cape Kudromurto bearing S. 73° E. which mark leads over the bar; then keep along by cape Kudromurto and the point within it and anchor off the Custom-house in a depth of 9 to 14 fathoms, mud.

**COAST.**—**Plataria bay** on the southern side of the Aio Nisi promontory recedes nearly  $3\frac{1}{2}$  miles to the village and low shore of the plain of Plataria, at its head. Its shores are rocky, but a cultivated valley extends south-eastward between bold precipitous ridges.

Chart, 206 [816].  
Lat.  $39^{\circ} 27' N.$   
Long.  $20 16 E.$   
Var.  $6 20 W.$

The bay is open to the westward and the water deep, but two rocky patches lie in the centre near its head having 5 and 3 fathoms water on them, the first rather more than one mile, the last three-quarters of a mile from the beach, with deep water round them.

This bay is seldom resorted to as an anchorage, and is subject to heavy squalls during southerly gales.

Hieronisi islet, 115 feet high, the southern entrance point, is almost connected with the extreme of the high land, the base of which forms the southern side of the bay; it bears S. by W.  $2\frac{3}{4}$  miles from Aio Nisi islet, the northern point.

**Sivota island**, situated  $2\frac{1}{2}$  miles south of Hieronisi islet, is a mile in length north-west and south-east, rocky, 384 feet high, and thickly wooded. Between it and the coast in the vicinity of cape Bianco, the south extreme of Corfu island is the entrance of the South channel of Corfu which is 4 miles wide. From its dark colour, Sivota is conspicuous and its light renders it important in the navigation of the channel at night; the water is deep half a mile from it.

**LIGHT.**—From a lighthouse about 200 yards within the north-western extreme of Sivota island is exhibited at an elevation of 282 feet above the sea, a *white flashing* light, visible in clear weather from a distance of 20 miles; flashes take place at *half minute* intervals, total eclipses intervening. The light has been reported to be irregular; it is obscured by cape Bianco.

Lat.  $39^{\circ} 24' N.$   
Long.  $20 13 E.$

**Port Murzo.**—**San Nikolo island.**—Between Sivota and the mainland is the smaller island of San Nikolo, 237 feet high, with its southern point united to Sivota by a reef of rocks. San Nikolo is separated from the coast by a channel 2 to 3 cables wide and 7 cables in length, in the south-eastern bend of which is the snug little port of Murzo; the Custom house may be seen on the south-eastern shore.

Lat.  $39^{\circ} 24' N.$   
Long.  $20 15 E.$

At the entrance of the port on the northern side of San Nikolo islet, there is a depth of 20 fathoms, diminishing rapidly within; the southern passage between the two islands of Sivota and San Nikolo on the one side, and the mainland on the other, has only 2 fathoms water. Small vessels visiting this port anchor in 4 fathoms near the house of the Aga or commandant and secure with hawsers to the shore.

**Coal and Supplies.**—Water can be obtained from a spring near the village and provisions are cheap. The Turks have a *dépôt* of coal in the little channel which separates San Nikolo island from the mainland, this being a port visited by their vessels of war.

**Coast.**—About 11 miles south-eastward of Sivota island is cape Keladio, the western point of the port of Parga; the intervening coast rises in high rugged ridges partially wooded, the shore being rocky with a few small sandy bays, clear of danger, and the water all along is deep half a mile from the shore; it is backed by high mountainous land which, one mile within cape Varlam, is 1,656 feet high. As the coast at night may become obscure a good look out should be kept.

Less than a mile south-eastward of Sivota island is a semi-circular bay 6 cables wide and open southward; its eastern point is a considerable projection from the coast and has sunken rocks around it; there is also a rock above water in the bay, within which there is a depth of 14 fathoms. About  $1\frac{3}{4}$  miles beyond this bay is that of Arpiza, a small indentation in

Chart, 206 [816].  
Var. 6° 20' W.

Lat. 39° 21' N.  
Long. 20 18 E.

the land with two small islets or rocks close to the coast, one north of the bay, the other south of it, and about three-quarters of a mile apart. A mile farther southward is Arilla bay and beach, open to the west; between these two last bays, is a large isolated hill 1,104 feet above the sea; the village of Arilla stands on its southern side.

About a mile southward of Arilla is a small and unimportant bay with the little river Paramythia flowing into it; and about 1½ miles farther on is a small islet or rock half a cable from the shore on the narrow bank which borders the coast in this vicinity. The islet is just northward of cape Varlam, the south-western extreme of the curve of this steep coast but by no means a salient point. From this islet to cape Keladio, the coast is bold, steep-to, and the distance 4½ miles.

Plan of port  
Parga on chart,  
206 [816].  
Lat. 39° 16' N.  
Long. 20 24 E.

**PARGA**, ancient *Toryne*, is a town containing about 5,000 inhabitants which, with its citadel (in ruins), stands on a conical rocky height 263 feet above the sea. The streets are narrow and dirty and the houses straggling. The adjacent country is fertile and produces an abundance of tobacco, fruit, olives, and tolerably good wine; in all of which an export trade is carried on.

The little port of Parga is divided into two bays by the projection on which the old citadel stands; one of these was anciently called "the port of Sweet Waters," afterwards port Velike. The larger bay, westward of the citadel, is semicircular, with a sandy beach at its head, and the remains of an ancient mole on the south-western side; it is about 3 cables wide and 3 cables deep, with from 6 to 7 fathoms water in the middle, and is open to the southward. The anchorage is in 7 fathoms, mud, about 1½ cables south-westward of the citadel shore.

The other bay, south-eastward of the citadel, is now considered to be the port and is protected from the sea by a chain of islets and rocks extending 4 cables south-westward from St. Anastasio point, on which is a chapel, and on one of the islets is the lazaretto. This bay is nearly a cable wide at the entrance and 2½ cables deep, with 5 to 8 fathoms, sandy bottom, and is open to the south-westward. Both of these bays are fit for small vessels only, and coasters usually prefer the eastern.

Lat. 39° 16' N.  
Long. 20 24 E.

**Cape Keladio**, the western point of port Parga, is steep and rugged 173 feet high, and has on it a conspicuous square tower, being part of the ruins of the convent of St. Spiridione. On the western side of the point is a small islet, and on the eastern side, about a cable from the shore, is the Spiridione rocky ledge awash.

The entrance to the port is 2½ cables wide between this rocky ledge and the Turkika rocks, the outermost of the chain extending from St. Anastasio point.

During fine summer weather, vessels find temporary anchorage off Parga, outside the port, in about 20 fathoms, mud, 3½ cables from the shore of the citadel, with cape Keladio bearing W.N.W.

At 1½ miles eastward of cape Keladio is the islet of St. Nikolo, 50 feet high, with a white chapel on its summit; it lies 2 cables from the shore at Pogogna point, and in the space between there is a depth of 22 fathoms. At about 2 miles eastward of St. Nikolo is the port of St. Giovanni.

Plan of port  
St. Giovanni on  
chart, 206 [816].  
Lat. 39° 16' N.  
Long. 20 29 E.

**Port St. Giovanni**, ancient *Acherusia*, open to the southward is about 7 cables in extent north and south by 5 cables in width, with a depth of 20 fathoms at the entrance decreasing to 6 fathoms near the head. It is surrounded by high limestone hills and its north-eastern shore is skirted by rocks, but its sides all round may be closed to about a cable. Small vessels anchor in a depth of 8 or 9 fathoms off Skuluki cove, in the

north-western corner of the bay, where they also moor, but the best anchorage with northerly winds is in 13 fathoms, mud, in the middle of the bay. Var. 6° 20' W.

Within the western point of the bay, off the first cove, is a remarkable fresh-water spring, rising from a depth of 12 fathoms; half way up the eastern shore, near a cultivated patch of ground, excellent water may be obtained.

**Port Phanari**, ancient *Glycys*, is situated  $1\frac{3}{4}$  miles southward of port St. Giovanni, the coast between, consisting of high, red, rocky cliffs, being free from danger. Plan of port  
Phanari on chart,  
206 [816].  
Lat. 39° 14' N.  
Long. 20 30 E.

The entrance to port Phanari is less than  $1\frac{1}{2}$  cables wide and exposed to south-westerly winds; the interior opens out to the northward, is circular, and from 4 to 5 cables in diameter, but this expanse of water is deceptive, as a large portion of the port is silted up by the alluvium from the river Gurla, nearly the whole of the port westward from the sandy shore which borders it being shallow. The deep water extends only  $1\frac{1}{2}$  cables from the western side of the port and about 4 cables along that shore, the deep space gradually becoming narrow and shallow towards the north.

The village of Phanari is on the eastern shore.

The northern point of entrance is 50 feet high; its sea face for nearly half a mile northward is skirted by sunken rocks, and one rock, 6 feet high, lies  $2\frac{1}{2}$  cables from the southern extreme of the point and about half a cable from the shore; another, a large grey rock, is close in-shore about a cable from the point. The southern point of entrance is a tongue of land projecting northward, 75 feet high, with a chapel on its summit. The position of the port may be known from seaward by the ruins of a castle on a hill,  $2\frac{1}{2}$  miles E.  $\frac{1}{2}$  S. from the entrance; also by the cliffs on either hand being wedge-shaped.

The anchorage is in a depth of  $5\frac{1}{2}$  fathoms about  $1\frac{1}{2}$  cables N.E. by E.  $\frac{1}{4}$  E. from the northern point of entrance and a short cable from the western shore; country vessels winter here, anchoring on the western shore and hauling close in to the rocks. There is also temporary anchorage in fine weather during summer 3 cables south-westward of the entrance, in 10 fathoms; outside this, the depth increases rapidly.

The river Gurla, ancient *Acheron*, runs into the south-eastern part of the port and is a considerable stream; it has only 2 feet water on the bar, but boats can ascend some distance and drinking water may be obtained from it. The Vuvo, ancient *Cocytus*, flows into the Gurla from the northward about  $2\frac{1}{2}$  miles from its mouth, passing round the southern end of the hill on which stands the ruined castle.

The stream generally runs out of port Phanari at the rate of about  $1\frac{1}{2}$  miles an hour, but it is much stronger during the rainy season.

**Coast.**—The valley in the interior is well cultivated, and visible some distance, the land on its south-eastern side rising to 3,000 feet above the sea at mount Zarothema, 7 miles from Phanari. The coast for some distance southward of port Phanari is rocky, followed by sandy beaches separated by small points. At  $8\frac{1}{2}$  miles south-eastward of Phanari are the picturesque ruins of the castle of Riniassa, perched on a limestone rock about 535 feet above the sea; the castle has apparently been destroyed by an earthquake splitting the entire hill in twain, leaving a deep perpendicular chasm dividing the fortress longitudinally. At 3 miles further on, is Kastrosikia point, with the town of the same name a long half mile

Charts, 206 [816].  
203 [819].  
Lat. 39° 11' N.  
Long. 20 33 E.

Chart, 203 [819].  
Var. 6° 20' W.

north-eastward of it. From 2 miles southward of Phanari, the shore is bordered by a bank having one to 4 fathoms water at 2 to 6 cables from it.

Lat. 39° 5' N.  
Long. 20 39 E.

**Kastrosikia point** is a slightly projecting low red bluff, the termination of the southern slope of mount Zarothema, with a beach on either side; it is the northern extreme of Gomaros bay. The point is surrounded, at the distance of about 7 cables, by a rocky shoal, terminating south-westward in the Ittisa reef, with about 4 feet water. Three-quarters of a mile north-westward of the point, and half a mile from the shore, is a rock awash.

As the shoals surrounding Kastrosikia point are steep-to, it should have a wide berth; the soundings are irregular, and there is a depth of 9 or 10 fathoms close to the reefs.

Lat. 39° 4' N.  
Long. 20 40 E.

**Gomaros bay** is the indentation in the shore between Kastrosikia point and Mytika bluff, about 6 miles south of it; within this line, the bay recedes barely  $1\frac{1}{2}$  miles, the shore throughout being a sandy beach through which several streams of fresh water run into the sea, with a chain of hills a mile inland.

Near the middle of the bay is the village of Kanali, and over the southern part of the bay is mount Mikalitzza, 520 feet high, with a building on its summit; below and south-westward of it are the remains of an ancient mole projecting 2 cables from the shore. Southward of mount Mikalitzza, the Romans made a canal to unite the gulf of Arta (*Ambraikos*) with the Ionian sea; the isthmus now dividing them at this spot is about  $1\frac{1}{2}$  miles wide. The ruins of the ancient Nicopolis are here scattered over the ground.

Northward of mount Mikalitzza, the bay affords anchorage with off-shore winds in a depth of 10 or 11 fathoms at half a mile from the shore; farther off the depth increases rapidly. From about a mile northward of the ancient mole, the beach southward to Mytika bluff is bordered by a bank with 5 fathoms water, extending in places nearly a mile off-shore.

Small coasting vessels load with the produce of the country in the northern corner of the bay, where there is a Custom-house, sheltered from the westward by the Ittisa reef.

**Mytika bluff**, the southern point of Gomaros bay, has on its eastern side a small cove near the village of Mytika. At 3 cables northward of the bluff, and rather more than this distance from the beach, is a rock awash. Mytika bluff is clifty, surrounded by shallow rocky ground, and at 8 cables westward of it there is but  $3\frac{1}{4}$  fathoms water; the bank is steep-to and 5 cables beyond this the depth is 30 fathoms.

\*Lat. 38° 56' N.  
Long. 20 45 E.

Between the bluff and Fort Pantakratora\* on the northern side of the entrance to Prevesa strait,  $3\frac{3}{4}$  miles farther southward, the land is thickly covered with olive trees, the coast is clifty with a sandy beach, and is skirted by a continuous chain of rocks extending half a mile off the bluff but not so far southward. The whole of this part of the coast, between the parallel of mount Mikalitzza and Prevesa strait, should have a wide berth and attention should be given to the lead when near it.

For the gulf of Arta, see page 294.

Chart, 206 [816].

**CORFU ISLAND.** — **General remarks.** — Corfu, ancient *Kerkyra*, the most important of the Ionian islands, may be considered the key of the Adriatic, and from its position has had a chequered political existence; it was formerly a much-prized Venetian possession. Corfu was

occupied during the wars of the latter part of the 18th century and early part of the last century by different belligerents in succession; next, assigned as one of the islands of the Ionian Republic to British protection by the treaty of Vienna; and, finally, with all the other islands of the republic, incorporated with the Kingdom of Greece in the year 1864.

The island is about 33 miles in length north-west and south-east with an irregular coast line, the northern portion of the island being  $15\frac{1}{2}$  miles in breadth east and west, but at 7 miles from its northern extreme, suddenly contracting to less than 6 miles; southward of the town of Corfu, to about 5 miles; and at the head of Lefkimo bay, 6 miles from its south-eastern extreme, to 2 miles; its total area is about 200 square nautical miles.

In general, the island is mountainous and covered throughout with olive plantations. Mount St. Salvador, the highest part of the northern ridge, has two remarkable conical peaks 3,000 feet above the sea, with flat table land between them; its sides are precipitous, thickly wooded, and cut up with deep ravines and watercourses. On the western side of the island and farther southward, mount St. Giorgio rises 1,288 feet high, close to the sea; and, beyond it, mount Santa Decca 1,859 feet.

**The population** of the island by the census of 1897, including adjacent small islets, was 129,042.

**Trade.**—The principal exports are oil, olives, wine, and soap; the imports are cereals, coal, cotton, and other manufactures; iron, tin, and hardware, principally from Great Britain; sugar, coffee, rice, &c.; it produces excellent fruit and vegetables, and a small quantity of corn. Provisions of all kinds are easily procured.

The number of vessels that entered and cleared in 1907 was 1,390, amounting to 990,968 tons; the value of the exports was 88,560*l.*, and of the imports 210,600*l.*

**Communication.—Telegraph cables.**—There is weekly communication with almost all parts of the Mediterranean by means of Austrian, Italian, and Greek steamers, and the island is in telegraphic communication with the Continent by means of the Eastern Telegraph Company's system, and with the other Ionian islands by Greek Government cables. That from Trieste passes through the north channel and is landed at the town of Corfu. The cable from Otranto is landed near Sidari in the northern end of the island; whilst those connecting with Paxo and with Santa Maura leave the shore just westward of cape Bianco.

**Time.**—Athens time is kept at Corfu; see page 9.

**CAPE ST. KATERINA**, the northern point of Corfu is somewhat low, but easily distinguished by the church on its summit about 200 feet high. It lies nearly 6 miles south-westward from cape Kiephali of Epirus, and between these points is the entrance to the North channel of Corfu.

**Aprau bay.**—Rather less than  $1\frac{1}{2}$  miles south-eastward of cape St. Katerina is Spiridione point, the water being shoal nearly half a mile off between them. Following Spiridione point  $2\frac{1}{4}$  miles farther on is Cassopo point, on which are the ruins of a Venetian fortress; the intermediate coast forms the bay of Aprau, where there is anchorage with off-shore winds in depths of 11 to 19 fathoms. On the south-western side of Cassopo point is the little port or Cassopetto, with 4 fathoms water. These places are seldom resorted to but by fishermen.

Chart 206 [816].  
 Lat. 39° 47' N.  
 Long. 19 57 E.  
 Var. 6 30 W.

**Bolana bay.**—After passing Cassopo point, a mile farther south-eastward is Barbara point, and between them is Bolana bay, oval in form, 4 cables wide and 6 cables deep, with a depth of 8 to 15 fathoms. This bay affords shelter from southerly winds, but is quite open northward, and seldom used except by fishermen.

A bank about  $1\frac{1}{2}$  cables in extent, with a depth of 7 fathoms and steep-to, is situated at a distance of  $2\frac{1}{4}$  cables N.N.W. from Barbara point.

**TIGNOSO ISLET.**—This little islet lies 8 cables eastward from Barbara point; it resembles a number of whitish stones irregularly placed one upon the other, and is crowned by a circular white lighthouse and a few small trees. See view of Tignoso islet on chart No. 206.

At 2 cables northward of Tignoso is a small rock above water, and the two are united by a tongue of shallow ground. This rock has occasionally been reported as non-existent. No doubt it is at times under water, the North channel to Corfu being peculiarly subject to fluctuations in depth according to the direction of the wind. See remarks on this subject at page 17.

Nearly half a mile eastward of Tignoso is the Barchetta, a rock only a few feet above the water, and so named from its resemblance to a boat; it is steep-to, and with a depth of 19 fathoms between it and the islet.

About 2 cables northward of the Barchetta is a rock with 6 feet water. Eastward of the Barchetta, and westward of Tignoso, the channels are clear. See directions, page 291.

Lat. 39° 47' N.  
 Long. 19 58 E.

**LIGHT.**—From the lighthouse on Tignoso islet, 55 feet in height, is exhibited, at an elevation of 100 feet above the sea, a *fixed white* light, varied by a *red flash* once every minute, visible in clear weather from a distance of 14 miles.

**From Barbara point,** the coast trends south-eastward about one mile to San Stefano point, which is moderately high, and is the eastern extreme of Corfu at its northern end; a flat rock extends out from a point south of Barbara point, and northward of San Stefano point are some sunken rocks near the shore. Half a mile south-westward of San Stefano point are (or were) the ruins of a mill on a hill 396 feet high.

Lat. 39° 46' N.  
 Long. 19 58 E.

**Serpa rocks,** just awash, lie about 3 cables from the southern point of the small bay under the hill 396 feet high, south of San Stefano point. These rocks are steep-to, having deep water on their eastern side, and contract the width of the channel between them and the coast of Albania to rather less than one mile. In calm weather, they are seen by their reddish colour in contrast with the blue water.

At night, vessels should keep well over on the Albanian shore.

**Port San Stefano** is a small bay southward of the hill above mentioned, open to the south, with about  $2\frac{1}{2}$  fathoms water in the middle; it is fit only for small coasters.

Port Karagol is another small bay open to the eastward, fit only for boats; it has a little mole and a chapel near it.

Lat. 39° 42' N.  
 Long. 19 52 E.

**Tpsa bay.**—From Karagol point,  $1\frac{1}{2}$  miles southward of San Stefano point, the coast trends westward along the base of the steep craggy slopes of mount St. Salvador and is bold and steep-to; at  $5\frac{1}{4}$  miles from Karagol point is the head of Tpsa bay, from whence the shore trends at first southward and then eastward to the town of Corfu. The land is thickly covered with olive trees.

Vessels occasionally anchor in Tpsa bay in depths of from 7 to 10 fathoms, mud. Chart, 206 [816].  
Var. 6° 30' W.

**Port Govino.**—About  $3\frac{1}{2}$  miles north-westward of the town of Corfu is the well sheltered port of Govino, a mile deep, but narrow, owing to the accumulation of mud on both shores. It is surrounded by marshes which cause fevers, and, in consequence, is now seldom used as a port. Here the Venetians had their arsenal, and its ruins are still visible along the western shore. It has depths of 4 to  $4\frac{1}{2}$  fathoms, but the mudbanks which contract the deep water surround both points of entrance. Plan of  
Corfu road,  
1,450 [817].  
Lat. 39° 59' N.  
Long. 19 52 E.

Comeni head, a small round promontory 130 feet high with a small islet on its southern side, lies about 2 miles southward of Tpsa bay, and is on the northern side of the entrance to the port.

**CORFU TOWN**, ancient *Kerkyra*, on the eastern side of the island and standing picturesquely on a promontory, washed on either side by the sea, and terminating in cape Sidero, was formerly a place of considerable strength.\* On the eastern part of the promontory is the citadel, separated from the town by a ditch or fosse with 7 or 8 feet water, built on a rugged precipitous rock with its summit split into two peaks, each crowned by a battery; on the western and highest peak is the light-house and signal station. At the north-eastern extreme is the Flagstaff bastion. Lat. 39° 37' N.  
Long. 19 57 E.

The town is surrounded by fortifications; Fort Neuf, built by the Venetians, forms the north-western extreme. On the eastern face of the town is the Government house and a fine esplanade and parade ground, laid out with walks and avenues of trees and commanding a magnificent view. The streets of the town are narrow but clean; there are several churches, a theatre, and hotels. The Sanità or health office and Custom-house are on the northern face of the town. In the ditch, on the western side of the citadel, is the principal landing place, from whence a flight of steps leads up to the esplanade.

An admirable Strada marina runs round Kastrades bay southward of the citadel and is a much frequented public drive and promenade. The neighbourhood is adorned with gardens, country houses, olive grounds, and vineyards. Excellent roads in every direction lead through extensive plains of rich, well-cultivated land to the numerous villages, many of which are on the sides of steep well-wooded ridges, commanding scenery not to be surpassed for grandeur and beauty in any part of the world.

**Population.**—The town, including the suburbs of Mandukio on the west and Kastrades on the south, contained 29,135 inhabitants in 1895.

**Breakwater.**—A breakwater has been proposed off Mandukio, just westward of the town, and a breakwater partly built extends westward from the health office; the enclosed space is shallow, apparently.

On the northern face of the citadel is a camber in which small vessels lie in 6 feet water; a gate at its south-eastern angle leads up into the citadel.

**Coal and Supplies.**—Corfu affords resources of all kinds.

Coal is supplied by lighter to vessels in the road, being put on board at about  $24\frac{6}{10}$  per ton for Welsh coal; from 3,000 to 4,000 tons are usually in stock. There are two coal wharfs, 80 feet and 60 feet in length, with a depth of 7 feet alongside them.

Provisions are abundant, and a copious supply of water has been brought in pipes from a source above the village of Benizza, a distance of 7 miles, and may be procured near the health office on the northern side of the town. Vessels of war are supplied with water from a pipe leading down to the ditch of the citadel, or it can be obtained from contractor

\* These forts were dismantled when the islands were ceded to Greece in 1864.  
General chart, 1,800 [815].

Plan of  
Corfu road,  
1,450 [817],  
Var. 6° 30' W.

in tanks having a capacity of about 7 tuns. In summer, if the water gets scarce, it is procured from Butrinto on the mainland.

**Repairs.**—There are ship-yards where small repairs can be executed, but no docks of any description.

**Meteorological Table.**—See page 375.

**LIGHT.**—From a circular white lighthouse 33 feet high in the Citadel, at an elevation of 245 feet above the sea a *fixed white* light is exhibited, visible in clear weather from a distance of 16 miles, between the bearings of N. 18° E., through west and south, to S. 72° E.

A small *fixed red* light is also shown in the harbour at the mole head near the health office.

Lat. 39° 38' N.  
Long. 19 55 E.

**CORFU ROAD** extends along the northern face of the town and is sheltered by the island of Vido from the strong north-easterly winds which blow with violence during the winter months; it affords anchorage over an area about 2 miles in length and three-quarters of a mile in breadth, in depths of from 10 to 16 fathoms, stiff mud and clay.

The best berth for a vessel of war is about mid-channel, with cape Scala, near Butrinto on the Albanian shore, shut in with the eastern extreme of Vido; small vessels moor off the camber under the citadel.

Merchant vessels anchor off the health office and Custom-house, in 5 to 10 fathoms, but vessels in quarantine are sent to Lazaretto island, off the entrance of port Govino, where they lie until they receive pratique. See below.

It has been proposed to construct a breakwater to project in an easterly direction from Kefalo-mandukio, at mount Olivet, as mentioned in page 283.

**Vido island**, 142 feet high, of triangular form, extending somewhat more than half a mile east and west, is half a mile wide at its eastern side; it is nearly steep to except on its northern side, where there are some out-lying rocks a cable from the shore.

**Shoals.**—Nearly 4 cables westward of Vido is the small rocky islet Calovero, 30 feet high and surrounded by shoal water; a rocky 4½-fathoms patch lies E.S.E. of the islet and midway between it and Vido; there is another patch, with 4¾ fathoms, 3¼ cables N.E. by E. of Calovero.

The passage between the islet and Vido should be taken only by small vessels.

**Quarantine.**—**Lazaretto island**, the quarantine establishment, is 1¼ miles westward of Calovero islet; it is 68 feet high and about 2 cables in length. Vessels in quarantine anchor in a depth of 13 fathoms about 3 cables southward of the Lazaretto.

Vessels bound for any port in Greece and arriving from infected ports have to present themselves either at this port, at Trisonia near Patras, or at Delos.

**Kastrades bay.**—Cape Sidero, the eastern extreme of the rocky mass on which the citadel of Corfu stands, is the northern point of Kastrades bay. This bay is about three-quarters of a mile in extent, shallow, and used only by fishing-boats; along the shore is the Strada marina, already described.

A promontory projecting southward from Kastrades bay and terminating in One gun point, covers lake Kalikiopulo, at the mouth of which is the picturesque little islet of Ulysses, 64 feet high, with a chapel on it and once connected with the mainland by a causeway. The lake is shallow and silting up.

**Benizza.**—At 2¼ miles southward of Ulysses islet is the village of Benizza, under the sharp peaks of mounts Santa Decca and Santa Croce, the former 1,859 feet high and the highest land in the southern

Lat. 39° 34' N.  
Long. 19 56 E.

Chart, 206 [816].

part of Corfu; the latter 1,476 feet high. Near the village are the springs which supply the town of Corfu with water. Vessels occasionally anchor off the village in a depth of 9 fathoms. The land from the northward is undulating and thickly wooded.

Chart, 206 [816].  
Var. 6° 30' W.

The coast from Benizza trends southward and eastward about 7 miles to Buccari point. The village of Mirangi is on the beach in the bend of the coast, southward of a stream of water. Vessels occasionally anchor here in depths of 8 or 9 fathoms, sand. The land here rises in thickly wooded ridges towards the peaks of Santa Croce and Santa Decca.

Buccari point, 3 miles from Mirangi, is rounded and 274 feet high; the intermediate shore is low. Under this point there is anchorage in 10 fathoms, sand.

**Lefkimo point**, ancient *Levkimni*,  $3\frac{1}{2}$  miles eastward from Buccari point, is a long tongue of sand projecting north-eastward with shallow water extending about half a mile beyond it. The low shore between the two points forms Lefkimo bay, which is  $1\frac{1}{2}$  miles deep and has a depth of 16 fathoms in the middle; the shore round the bay is bordered at a short distance by shallow water. A mile south-westward of the point are the Salternes of Lefkimo.

Lat. 39° 27' N.  
Long. 20° 5' E.

**Lights**.—On Lefkimo point, from a metal pillar over an iron shed, a *fixed red* light is exhibited at an elevation of 20 feet above the sea, visible at the distance of 2 miles.

A small *fixed white* light is shown occasionally at the Salternes in Lefkimo bay, about  $1\frac{1}{2}$  miles westward of Lefkimo point.

A small *fixed white* light, elevated 17 feet above the sea, visible in clear weather from a distance of 3 miles is shown occasionally from a square stone column on the centre of the pier on the southern side of the Potami river, about  $1\frac{1}{2}$  miles southward of Lefkimo point.

Lat. 39° 25' N.  
Long. 20° 6' E.

**Anchorage**.—Excellent anchorage will be found in Lefkimo bay in a depth of 15 to 17 fathoms. A good berth for a large vessel is with Sivota lighthouse and a storehouse at Salternes in line, S. 64° E.; and Lefkimo point light bearing N. 88° E. Caution is necessary in rounding the spit extending from Lefkimo point.

**Clearing mark**.—In steering for Corfu road by the South channel, the western peak of mount St. Salvador in line with the centre of Vido island N.N.W.  $\frac{1}{2}$  W., leads eastward of all shoal water off Lefkimo point.

**CAPE BIANCO**, the south extreme of the island of Corfu, is 6 miles southward of Lefkimo point; the intervening shore is low and bordered at the distance of from half to three-quarters of a mile by shallow water interspersed with rocks.

Lat. 39° 21' N.  
Long. 20° 8' E.

There is anchorage with westerly winds in depths of 10 to 12 fathoms, sand, all along the coast until within about 2 miles of the cape, which is about 330 feet high, and a hill  $1\frac{1}{2}$  miles north-westward of it is 481 feet high. Cape Bianco is composed of white cliffs resembling those of Beachy head on the South coast of England. See view C, on chart No. 206.

**Telegraph cables**.—The cables connecting Corfu with Paxo and with Santa Maura leave the shore a short distance westward of cape Bianco.

**Bianco shoal**.—Cape Bianco is surrounded by a sandy shoal extending southward about 2 miles, and in a south-easterly direction, about the same distance from the cape. This shoal should be approached with caution and not rounded too closely, as the depths over it are very irregular.

Corfu citadel, well open westward of mount St. Salvador, N.N.W.  $\frac{1}{2}$  W., leads eastward of the shoal. See directions, page 292.

Chart, 206 [816].  
 Lat. 39° 23' N.  
 Long. 20 1 E.  
 Var. 6 30 W.

**WEST COAST.**—**Maga Khoro point**, 5½ miles north-westward of cape Bianco, is low, and like the intervening shore, is foul and rocky. At 8 cables S.W. ½ W. from the point is a rocky one-fathom patch; and half a mile southward of the patch is a rocky bank with 8 fathoms, the water quickly deepening outside it to 20 fathoms.

Lat. 39° 24' N.  
 Long. 19 55 E.

**Lagudia rocks.**—These two flat rocky islets are a mile south-westward of Konsia point; a sunken reef lies nearly three-quarters of a mile south-eastward of the rocks.

Konsia point, 4½ miles beyond Maga Khoro point, is low with shallow water extending nearly three-quarters of a mile off it, and the depth between this shoal and the Lagudia rocks is from 4 to 5 fathoms.

Vessels frequently anchor all along this coast as far as cape Bianco in a depth of 9 to 10 fathoms, fine sand, sheltered against the strong north-easterly winter gales which blow with violence.

**Coast.**—Between Konsia and Kardiki points, about 2½ miles apart, the coast is low and sandy, and within it is the shallow salt water lake of Corissa, 3 miles in length and half a mile in breadth. From Kardiki point, the coast trends northward about 4½ miles as far as cape Faskia, and is the base of the Paviliana and Garuna mountains, the land ranging 1,440 and 1,530 feet high less than half a mile within the coast line.

**Rocks.**—Northward of the Lagudia rocks, the coast, which forms an outward curve, is studded with off-lying rocks and rocky patches having from 2 to 3 fathoms water on them and nearly steep-to. The Bragonitica shoal, the outer danger, lies 1¼ miles S.S.W. ½ W. from Kardiki point, and N.W. ½ W. 2½ miles from the outer Lagudia rock. These dangers should be given a wide berth.

The little islet of Tholetho with a rock above water close to it, just northward of cape Faskia, has on its western side the little port of Nicolo di Mitika, 2 cables wide, which is visited by small coasters. The shore to the northward is at first a sandy beach, which is followed by an irregular rugged coast, the land immediately within being from 785 to 893 feet high.

Gordi islets or rocks are about 2½ miles northward of Tholetho islet and 3 cables from the shore, with 5 fathoms inside and deep water half a mile outside them.

Lat. 39° 35' N.  
 Long. 19 47 E.

**St. Giorgio point**, 2¾ miles north of Gordi rocks, is at the foot of mount St. Giorgio, a high, round, steep promontory 1,288 feet above the sea; its coast line is irregular, rugged, steep and rocky. A small stream after watering a fertile valley runs into Ermones bay, northward of mount St. Giorgio; the latter at a distance appearing isolated.

**Plakka point**, 1¾ miles north-westward of St. Giorgio point, is high and slightly projecting, with a depth of 50 fathoms close to; 3 miles farther on is the entrance to Liapades bay; the intermediate coast is skirted close in-shore with rocks here and there and is precipitous, the land within rising in high bold ridges.

The little islet of Koliviri, a cable in diameter and steep-to, lies a mile north-west of Plakka point and half a mile from the cliffs.

Lat. 39° 40' N.  
 Long. 19 44 E.

**Liapades bay** recedes north-eastward upwards of a mile and affords shelter with northerly and easterly winds, and vessels occasionally anchor in a depth of about 10 fathoms, fine sand.

Plan of ports  
 Alipa and  
 St. Spiridione on  
 chart, 206 [816].

**Alipa and St. Spiridione.**—From the head of Liapades bay, the high and cliffy coast trends westward 2½ miles to cape Palacrum,

the two ports of Alipa and St. Spiridione, little coves open to the southward and only fit for coasting craft and fishing-boats, lying within this space. At a short distance from the coast the water is deep. During strong north-westerly winds, the squalls from the land are very heavy.

Plan on  
chart, 206 [816].  
Var. 6° 30' W.

**Cape Palacrum** rises from the sea in bold precipitous cliffs and is easily known by the picturesque ruins of the castle of St. Angelo, a Venetian fortress, standing on one of its rugged crags eastward of the cape and 1,081 feet above the sea.

Chart, 206 [816].

**St. George's bay.**—Cape Arilla, 2 miles northward of cape Palacrum, is round and bold, about 390 feet high, and is the termination of a tongue of land projecting nearly a mile south-westward and forming the western side of St. George's bay. At the head of the bay is a fine sandy beach; and, in the northern corner, there is good summer anchorage in depths of 6 to 9 fathoms, sand, but being exposed to south-westerly winds it is seldom resorted to. Immediately northward of cape Arilla is port Timone, a small bay fit for boats only.

Lat. 39° 42' N.  
Long. 19° 41' E

**Cape Kephali**, about 2½ miles northward of cape Arilla, is the western extreme of the island of Corfu and is a low tongue projecting westward, the land within rising in peaked hillocks; the intervening shore forms a shallow rocky bay, the first part of the coast being cliffy and followed by a fine sandy beach. Off the centre of the bay, nearly 1½ miles from the shore, is the islet of Kravia, 218 feet high, about 4 cables in length north and south, with two small islets or rocks at its northern end, and a sunken rock close to its southern end. In case of necessity, a vessel might anchor with westerly winds on the eastern side of this islet.

**Cape Drasti**, 3¾ miles north-east from cape Kephali, is a low white chalky projection surrounded by a shoal extending 4 cables northward of it with 2 to 3 fathoms water. The coast between the two capes, except close to cape Kephali, is composed of steep chalky cliffs bordered by shallow water; and, about midway, is a bank nearly a mile from the shore with from 2 to 3 fathoms water.

Lat. 39° 47' N.  
Long. 19° 41' E.

**NORTH COAST.**—**Sidari and St. Giorgio bays.**—From cape Drasti, the coast, generally low and sandy, trends eastward for 8 miles to cape St. Katerina, the north extreme of Corfu, curving slightly southward, and forming the sandy bays of Sidari and St. Giorgio, separated from each other 3½ miles eastward of cape Drasti by Astrakari point, easily known by its white cliffs; the shore throughout is bordered by shallow water and rocks. The thickly wooded slopes of the high land within have, at their bases, highly cultivated ground and small fertile plains.

Vessels frequently anchor in both Sidari and St. Giorgio bays, but the telegraph cable from Otranto is landed in this vicinity. From Sidari communication with the town of Corfu is easy by a good carriage road; fresh water may be procured from a stream eastward of the village of Sidari, standing near the beach.

**Astrakari shoal.**—Nearly 1½ miles north from Astrakari point is this rocky shoal, with one fathom water; and, about 3 cables farther north-westward, is another shoal with 4 fathoms.

The northern point of Diaplo islet, open of cape Drasti W. by S. ½ S., leads northwards of these dangers (see view A, on chart No. 206); St. Giorgio monastery, near the north-western corner of the lake of Butrinto on the mainland, open of cape St. Katerina E. by S. ¼ S., also leads northward of the shoals.

Chart, 206 [816].  
 Lat. 39° 45' N.  
 Long. 19 38 E.  
 Var. 6 30 W.

**Diaplo islet** is nearly two-thirds of a mile in length north and south, 152 feet high, clifty, and surrounded by rocks; its southern end bears N.W. by W.  $\frac{1}{4}$  W.  $1\frac{3}{4}$  miles from cape Kephali. Half a mile eastward of the southern part is a rock with one fathom water, and steep-to all round.

Diakopo islet, 101 feet high, adjoining the south-western side of Diaplo, is also clifty, about half a cable from its western end there is a flat reef.

Karavi or Ship rock, about 8 cables westward of Diakopo, is about 98 feet high and steep-to. About a cable south-eastward of Karavi is another large rock or islet; and 8 cables further southward is Plakka islet, 4 feet high, but bold.

The current amongst these islets and also between them and the mainland of Corfu is occasionally strong.

Lat. 39° 46' N.  
 Long. 19 32 E.

**SAMOTHRAKI ISLAND** is 2 miles in length north-north-west and south-south-east, its average breadth about half a mile, 500 feet high, and skirted all round by rocks. It is but sparsely inhabited.

Nearly midway between its south-eastern extreme and Karavi islet is a rocky one-fathom patch, with a depth of 7 fathoms on either side of it. A shoal extends a mile south-westward of the south-west point of the island, and, at its extreme, is the little islet of Platia. South-eastward of Platia, distant 4 cables, is a shoal extending nearly 4 cables farther in that direction with 2 fathoms water.

Trachia, a small islet 92 feet high, lies about three-quarters of a mile off the western side of Samothraki, and half a mile northward of this islet is a rock above water. Another rock above water lies half a mile north-westward of Saki point, the northern end of Samothraki; and nearly  $1\frac{1}{2}$  miles W.N.W. from Saki point, is a rocky 2-fathoms patch.

Vessels passing between Fano and Samothraki should keep nearer the former island to avoid the rocky 2-fathoms patch just mentioned.

Lat. 39° 51' N.  
 Long. 19 24 E.

**FANO ISLAND**, ancient *Othoni*, is the largest of the islands off the north-western part of Corfu, from which its south-eastern side is distant  $11\frac{1}{2}$  miles; Bocha point, its north-western extreme, lies 47 miles eastward of cape Santa Maria di Leuca, Italy. The island is 3 miles in length east and west, and from its western side, which is 2 miles in extent, its breadth decreases eastward. Its greatest height is at the south-western part which is 1,339 feet above the sea, and at its north-western end it attains a height of 1,034 feet; it is covered with pine trees, and, owing to the height of its extremes, appears forked when viewed from the westward. The western side is precipitous and from thence it slopes eastward. The island rises from the outer extreme of the bank extending north-westward from Corfu, and the 100-fathoms contour-line of soundings passes only about 6 or 7 cables westward of its western side. See view A on chart No. 206.

Fano is skirted by rocks and shallow patches. A small bay on the southern side affords shelter to a few coasting craft of the islands against the strong north-westerly summer breezes.

**Osprey rock**, with one fathom water and steep-to, lies about half a mile S.S.E.  $\frac{1}{2}$  E. from the western point of the bay.

Lat. 39° 51' N.  
 Long. 19 27 E.

**Shoals.—Kastri point**, the eastern extreme of the island, is 324 feet high, and has on it the remains of a Venetian fortress. Two dangerous rocky shoals lie near the point; one, of some length, with one

fathom on its southern head and 6 or 7 fathoms around it, lies three quarters of a mile E. by N.  $\frac{1}{2}$  N. from the point; the other, with 2 fathoms, lies nearly South half a mile from the point. Many other rocks and shoals lies nearer the shore, and, when in this vicinity, caution is necessary with reference to these dangers. Vessels frequently anchor in the sandy bay between Kastri and Avlaki points.

Chart, 206 [816].  
Var. 6° 30' W.

Fano contains about 1,000 inhabitants besides a small detachment of soldiers; the former are principally seafaring men who carry on a small trade along the neighbouring coasts. Provisions of all kinds are brought from Corfu, but the coast abounds with fish, and at certain seasons quail are plentiful on the island. Fresh water may be obtained in small quantities from a well in Avlaki bay.

**LIGHT.**—On Kastri point, at 360 yards from its extreme, is a round white tower 46 feet high, from which is exhibited, at an elevation of 346 feet above the sea, a *fixed white light* varied by a *red flash* every *minute*, visible in clear weather from a distance of 25 miles. The light is obscured from the westward by the high land of the island between the bearings of N. 47° E., through east, to S. 67° E. Reported to be visible only 15 miles, 1894.

**Merlera**, the most northern of the group of islands north-westward of Corfu, is  $6\frac{3}{4}$  miles eastward of Fano; the passage between them, with the exception of the shoals off Kastri point, being clear of danger. The island is  $1\frac{1}{2}$  miles in length north and south, nearly as wide, and 435 feet high at its northern end; its northern and western sides are cliffy and fringed with rocks, the cliffs on the northern side being white. On the southern side is a fine sandy bay used by small craft, but it is exposed to southerly winds and a heavy swell rolls in. A stream runs into the sea from copious springs on its eastern side.

Lat. 39° 53' N.  
Long. 19 36 E.

The population is about 400, principally seafaring men.

**PAXO ISLAND**, ancient *Paxi*, the smallest of the Ionian islands, is nearly  $5\frac{1}{2}$  miles in length north-west and south-east, not quite 2 miles in width, and its greatest height is 809 feet\*; its shores are generally bold, particularly the western side, which rises in steep white cliffs. In general, the island is flat and covered with one dense olive plantation. The principal town, Gayo, once a small fishing village, is of some extent, the houses are well built, and a wharf is erected along its sea face. There are several villages prettily situated amidst the thick olive groves, having an air of comfort not met with in the other islands. The island exports oil, firewood, and flat stones, and its population may be about 5,000. See view C, on chart No. 206.

\*Lat. 39° 12' N.  
Long. 20 11 E.

**Port Laka**, at the northern extreme of the island, is an indentation about 3 cables deep and a cable wide at the entrance, with from 2 to 3 fathoms water within, having a few houses at its head where boats resort during the summer months; but being open to north-easterly winds, coasting vessels seldom anchor here.

North-westward of the northern point of Paxo is Marmori reef, where there are two or three rocks above water, one 25 feet high; a shallow rocky patch extends about  $1\frac{1}{2}$  cables beyond them.

**LIGHT.**—On a high cliff at Laka point, about 800 yards S. by E. from the north-western extreme of Paxo, is a square white tower 20 feet high, rising from the keeper's dwelling, from which is exhibited at an elevation of 416 feet above the sea, a *fixed white light*, visible from a

Chart,  
206 [816].  
Var. 6° 20' W.

distance of 18 miles when bearing from N. 5° W., through east and south, to S. 83° W., reported to have been seen 28 miles on an exceptionally clear night, 1903.

**Telegraph cable.**—The cable connecting Corfu with Paxo is landed near Laka point.

On the eastern coast of Paxo, nearly midway between ports Laka and Gayo, and  $1\frac{3}{4}$  miles north-westward of Madonna lighthouse, are some rocks above water but close in-shore.

Lat. 39° 13' N.  
Long. 20 12 E.

**Paxos reef** lies south-east of port Laka outside the above-mentioned rocks, about one-third of a mile from the shore, with Madonna islet lighthouse bearing S.S.E.  $\frac{1}{2}$  E. distant  $1\frac{3}{10}$  miles.

Plan of port Gayo  
on chart,  
206 [816].  
Lat. 39° 12' N.  
Long. 20 13 E.

**Port Gayo** is an indentation in the eastern coast of Paxo sheltered by two islets. On Citadel islet, the larger of the two, is a fort; and on Madonna, the smaller and north-eastern islet, is a lighthouse; the islets are connected with the shore and with each other by shoal water, which also borders the north-eastern side of Madonna where the Zuane, a large rock, is above water.

Between the islets and the shore of Paxo is this well-sheltered creek, with a depth of from 4 to 10 fathoms; but, being narrow, the small vessels using it have to haul close in-shore and moor head and stern. The deep water is on the northern side of Citadel islet, the passage to the southward between Citadel islet and the town becoming very narrow and carrying only about one fathom water.

The town of Gayo is erected in a semicircle south-westward of Citadel islet in the bend of the creek; it contains about 2,000 inhabitants, who have to depend almost entirely on rain for their water supply. Small quantities of provisions may be obtained.

**LIGHT.—Madonna islet.**—The lighthouse on Madonna islet is a square tower 26 feet high, from which, at an elevation of 85 feet above the sea, a *fixed* light is exhibited showing *white* when bearing from S. 40° E., through south, to S. 83° W.; *green* from S. 83° W. to N. 77° W., over Madonna shoal; *white* from N. 77° W. to N. 28° W.; and a faint light also from N. 66° E., through east, to S. 54° E. The *white* light is visible in clear weather from a distance of 12 miles, *green* light at 7 miles.

Charts,  
206 [816],  
203 [819].  
\*Lat. 39° 9' N.  
Long. 20 15 E.

**ANTI PAXOS** is 2 miles in length, a mile in breadth, and generally level, but rises at its northern end to a height of 353 feet.\* It extends in the same direction as Paxo, from which it is separated by a deep passage, about a mile wide, in which there are strong current eddies; the coast is bordered by a narrow bank with a few rocks, but is free from danger with the exception of a 2-fathoms patch near its northern extreme. The Plakka group, consisting of several small islets or rocks lies off its south-eastern end, terminating in a reef extending little more than a cable from the outer islets; at its edge the water suddenly deepens.

On the eastern side of the island is a small bay near the only village, where the fishing-boats are secured. The chief occupation of the few inhabitants is the cultivation of patches of land which produces excellent fruit, but no oil.

**LIGHT.**—On Novara point, the south-east extreme of Anti Paxos, from a square masonry tower with dwelling attached, 39 feet in height, and at an elevation, of 136 feet above the sea, an *occulting* light is exhibited with a period of *seven seconds*, thus:—Light *five seconds*; eclipse, *two seconds*. The light shows *red* when bearing from N. 42° E., through north, to N. 48° W., over Vascaglia and Plakka rocks; *red* also from S. 11° W., through south, to

S. 7° E., over Madonna shoal; *white* elsewhere. The *white* light is visible in clear weather from a distance of 17 miles, *red* light at 12 miles.

Charts,  
206 [816],  
203 [819].  
Lat. 39° 12' N.  
Long. 20 16 E.  
Var. 6 20 W.

**Madonna shoal.**—This dangerous rocky shoal is about 6 cables in extent, east and west, by 4 cables north and south, its outer edges having upon it from 3 to 5 fathoms water, thence it suddenly deepens; the shallowest part, which at times uncovers, lies East  $2\frac{1}{4}$  miles from Madonna lighthouse. At  $5\frac{1}{2}$  cables south-eastward of the shallowest spot is a patch with 7 and 8 fathoms.

Half a mile clear of these shoals in all directions, there is a depth of from 40 to 55 fathoms, and the channel on either side is clear and deep. Sailing vessels should avoid their vicinity on account of the current.

**Clearing marks.**—Mount Mavronoros just open westward of Sivota island, bearing about North, leads westward of the shoal; Rodovari point, the north-western extreme of Anti Paxos, in line with or only just open of Kalkonisi islet at the south-eastern extreme of Paxo, also leads westward. Mount Mavronoros bearing N.  $\frac{3}{4}$  W. and well open eastward of the western peak of Sivota island, leads eastward of the shoal.

Madonna shoal is covered by the *red* sector of Novara point light and by the *green* sector of Madonna island light. Either *white* light in sight clears the shoal.

**DIRECTIONS.—North channel.**—To a steam vessel the approach to the anchorage at Corfu presents no difficulties as there is water sufficient for all classes of vessels either by the north or south channels.

Chart,  
206 [816].  
Plan,  
1,450 [817].  
Lat. 39° 50' N.  
Long. 19 56 E.

Sailing vessels approaching from the north-westward or from the Adriatic with northerly or westerly winds, should make for Fano island and leave both it and Merlera on the starboard hand. Arriving from the westward with a commanding breeze, a vessel may pass southward of Fano and Merlera giving the former a fair berth but passing nearer to it than to Samothraki; from one mile south of Merlera, an E. by S. course for 12 miles leads about one mile northward of St. Katerina point, the northern extreme of Corfu and entrance point to the North channel.

On entering the North channel, steer for Tignoso lighthouse and pass about  $1\frac{1}{2}$  or 2 cables westward of it; then bring it to bear N. by W.  $\frac{1}{4}$  W. and steer S. by E.  $\frac{1}{4}$  E. until the hill, 396 feet high (on which are, or were, the ruins of an old mill), south-westward of St. Stefano point bears W. by N.  $\frac{1}{2}$  N. when the vessel will be southward of the Serpa rocks and may steer as convenient for Corfu road. See sketch of Tignoso lighthouse on chart No. 206, and view B.

A vessel passing eastward of Tignoso lighthouse, should keep the southern end of Merlera island open of cape St. Katerina, until within a long half mile of the Albanian coast; then steer to the southward midway between that coast and the Barchetta rock, which is not larger than and not unlike a small boat bottom up, taking care not to bring Tignoso lighthouse more northerly than N. by W.  $\frac{1}{4}$  W. until the hill, 396 feet high (old mill), bears W. by N.  $\frac{1}{2}$  N.; then proceed as before.

With variable or contrary winds, it is advisable to keep the mainland aboard until southward of Serpa rocks.

**At Night,** a vessel should steer for Tignoso light, passing  $1\frac{1}{2}$  or 2 cables westward of it, then bring it to bear N. by W.  $\frac{1}{4}$  W. and keep it so until about  $1\frac{1}{2}$  miles southward of Tignoso light and assured of being

Chart, 206 [816].  
Plan, 1,450 [817].  
Var. 6° 20' W.

scuthward of the Serpa rocks, when the light on the citadel of Corfu will bear S. by W.  $\frac{3}{4}$  W. From thence, the vessel should be guided to Corfu road by the Citadel light.

In taking the passage between Tignoso and the mainland, give the light a berth of nearly a mile, and when at this distance eastward of it, with Corfu citadel light bearing S. by W.  $\frac{3}{4}$  W., steer this course which leads nearly midway between the Barchetta rock and the mainland. When Tignoso light bears W. by N.  $\frac{1}{2}$  N. the vessel is southward of Barchetta rock, but the same course for Corfu citadel light should still be continued, taking care not to bring Tignoso light northward of N. by W.  $\frac{1}{4}$  W. until  $1\frac{1}{2}$  miles southward of it, and give the coast of the mainland a prudent berth.

In working to the southward through the North channel, keep the mainland or Albanian shore aboard as it is bold and clear of danger, and stand only halfway towards the western shore until southward of Serpa rock.

Lat. 39° 20' N.  
Long. 20 15 E.

**South channel.**—The distance between cape Bianco and the northern end of Paxo is 7 miles, but the passage is contracted to about  $5\frac{1}{2}$  miles by the Bianco shoal. Approaching from the westward, keep in mid-channel, giving cape Bianco a berth of at least 3 miles, and, in rounding it at this distance, the vessel's position should be checked by bearings. Paxo lighthouse bearing S.S.W.  $\frac{1}{2}$  W., or Sivota island peak N.N.E.  $\frac{1}{2}$  E., leads south-eastward of Bianco shoal. *See* view C, on chart No. 206.

The coast of the mainland as far northward as Prasudi island is clear and bold; Lefkimo point should have a berth of about a mile, *see* page 285; and, when northward of Prasudi island, the white houses of the village of Mourzo should be kept open of that islet to avoid the Bacchante flats, which are steep-to. When Corfu citadel light is seen, alter course as convenient.

In coming from the south-eastward between Paxo and the mainland, the passage on either side of Madonna shoal may be taken; preference should be given to the passage eastward of the shoal, and in a sailing vessel, the mainland should be kept aboard, particularly towards sunset, as at night the wind is almost certain to be off the land; the current also sets to the northward along this coast.

**At Night.**—Coming from the north-westward or westward, Paxo light should be kept eastward of S.E., until Sivota light is in sight, when the two will enable the mariner to fix his position accurately. Paxo may be rounded at the distance of 2 to 3 miles, and when Sivota light bears N.N.E. or northward of that bearing it may be steered for, passing eastward of Bianco shoal. When about 2 miles from Sivota, steer to pass it from a mile to 2 miles distant; thence shape a course for Corfu road, being guided by Sivota light and by the lights of Lefkimo point and Corfu citadel as they are seen.

From the south-eastward, it is advisable, especially in a vessel under sail, to pass eastward of Madonna shoal, keeping in mid-channel or well over on the Albanian coast, which is clear and bold. In proceeding to the northward, when near Bianco shoal, do not bring Madonna light southward of S.  $\frac{1}{2}$  W. and steer towards Sivota island light and through the Corfu channel as before directed.

If proceeding westward of the Madonna shoal, keep Madonna island *white* light in sight until having passed through the *red* sector of

Novara point light, that light bearing eastward of S.  $7^{\circ}$  E. shows *white*; Chart, 206 [816].  
Var.  $6^{\circ} 20'$  W. thence, keep it showing *white* until the *red* sector of Madonna light is passed; thence for Sivota light bearing northward of N.N.E., passing it and proceeding towards Corfu road as before directed.

**Winds.**—South-easterly and south-westerly winds, accompanied by cloudy weather and heavy rains, are prevalent in the Corfu channel during the winter. Northerly and north-westerly winds sometimes blow with violence but do not last long. In the summer season, the breezes are generally light.

**Currents.**—The currents are fairly strong in the narrows between cape Scala and port St. Stefano; their general direction is northerly, but there is ordinarily a surface current depending on the force and direction of the wind; in strong winds, it attains a rate of between  $1\frac{1}{2}$  and 2 miles an hour.

For the coast of Albania northward of the gulf of Arta, *see* pages 272-280.

---

General chart, 1,800 [815].

## CHAPTER XI.

GULF OF ARTA AND COAST OF GREECE.—SANTA MAURA,  
CEPHALONIA, ITHACA, AND ADJACENT ISLANDS.

Chart.  
203 [819],  
Lat. 38° 56' N.  
Long. 20 46 E.  
Var. 6 10 W.

**GULF OF ARTA.**—General remarks.—This gulf, ancient *Ambrakikos*, has its entrance at position given in the margin, and is 18½ miles in length from Prevesa to the shore of Makrinoro ridge on the east, where its extreme breadth is about 10 miles, but the coast line is so irregular and indented with bays with long projecting points, that in places the dangers off the latter, on opposite sides of the gulf, are little more than 2 miles apart. There are a few islets in the gulf, some of which are covered with shrubs and verdure; the chief group is off Pothani point between Salagora road and the islets extending from Palmatero point near the entrance to the Arta river.

The Boundary between Turkey and Greece runs through Prevesa strait and across the gulf of Arta, and up the Arta river.

Nothing can be more beautiful and picturesque than the natural scenery of this gulf, and the numerous Greek and Roman ruins on its margin must always afford peculiar interest to those who have the good fortune to visit them. About an hour's walk from, or about 3 miles northward of Prevesa, is the site of Nicopolis, the city founded by the Emperor Augustus to celebrate his victory at Actium over the combined forces of Mark Anthony and Cleopatra; the ruins of this city lie scattered over a large space of ground. At the foot of a range of hills on the north, just on the slope, is a large amphitheatre with its front facing south, the most conspicuous and perfect of all the ruins now to be seen.

Throughout the shores of the gulf, the hills are mostly composed of rugged blocks of primitive limestone, in the crevices of which grow the wild myrtle, numerous ferns, prickly shrubs, and several bulbous roots; also, a little scarlet blossom, from which the Turks and Greeks manufacture the beautiful scarlet dye used for their caps and dresses, as well as a yellow flower from which a corresponding dye is produced.

Plan of Prevesa  
strait,  
1,591 [820].

**PREVESA.**—This town stands on the northern side just within the entrance of the gulf of Arta, close to the shore and facing eastward, with a fine plain extending westward and northward of it, studded with houses and interspersed with olive trees; from its position, ague is very prevalent at certain seasons. The streets are narrow, uneven, and often

unpaved, and the houses are chiefly constructed of wood or built in Turkish style of the adjoining ruins of Nicopolis. It was formerly one of the possessions of Venice, was subsequently occupied by the French, and was captured from them and almost destroyed by the Turks in 1798.

Plan,  
1,591 [820].  
Lat. 38° 57' N.  
Long. 20 46 E.  
Var. 6 10 W.

The population is approximately 5,000, of whom about three-fourths are Christians.

It is surrounded on the land side by a dry moat or ditch, the walls in many places being almost in ruins. Fort Nuovo within the walls on the north contains the Pacha's palace, principal mosque, residences of the chief authorities, &c. It defends the northern side of the harbour and the channel leading up the gulf. Fort St. Giorgio, at the south-western angle of the town, guards the entrance and anchorage of the port. Fort Pantakratora, which entirely covers the approach to the entrance of the gulf and is surrounded by a wet ditch, is much dilapidated and its interior in ruins.

**Communication.**—Prevesa communicates by telegraph with Arta and Janina, and with the general European system; it holds direct communication with Corfu by an Austrian-Lloyd's steamer every Sunday, and, indirectly, with Trieste, Brindisi, Marseilles, Constantinople, &c., by Austrian-Lloyd's, Greek Steam-ship Co., and Greek Panhellenion; but, in consequence of the entrance of the gulf having only about 12 feet water, small steam-vessels are selected.

**Trade.**—Trade with the neighbouring Greek ports, in Greek vessels, is tolerably brisk, especially with the island of Santa Maura, which provides this part of the province with wine. The only machinery in the town is a steam olive press and a corn mill.

The exports consist principally of olive oil, wool, butter, cheese, and valonia; the imports are cotton and woollen goods, colonials, petroleum, and wine. The number of vessels that entered in 1906 was 1,246 amounting to 167,483 tons. The total exports from Janina *via* Prevesa was about 80,000*l.*; the imports about 150,000*l.*

British vessels call here, in the beginning of each year, on their way up the gulf of Arta whither they proceed for valonia, which grows plentifully on the Greek coast; but, before proceeding thither, the vessel's papers are deposited in the vice-consulate at this port, there being no British consular officer at any of the places where they load. The coasting trade is almost entirely carried on by Turkish or Greek boats.

**The Port** of Prevesa is bounded on the west by the walls of the town, and on the east by the low sandy promontory on the opposite shore terminating northward in Akri point, on which are the ruins of a tower; it is nearly 7 cables in extent north and south, and about 4 cables east and west, with a depth of 7 to 10 fathoms. A fair berth for anchoring is with Akri tower E.  $\frac{3}{4}$  N., and the south-eastern bastion of Prevesa S.S.W.  $\frac{1}{4}$  W. in about 8 fathoms, mud.

Plan of Prevesa  
strait,  
1,591 [820].

From a little southward of fort Nuovo, a long shallow flat, covered with from 3 to 6 feet water, extends half way across to Akri point and borders the shore to the northward, but this is just northward of the parallel of Akri point and beyond the anchorage.

**Bar.**—Prevesa strait, the entrance to the gulf of Arta, is easily distinguished from seaward by the white forts of Pantakratora and Punta on either side. The strait is barred by an extensive flat, of which the

Plan,  
1,591 [820].  
Chart,  
203 [819].  
Var. 6° 10' W

outer edge extends from Pantakratora fort in an outward irregular curve southward to Skilee point,  $1\frac{1}{2}$  miles distant on the other side.

The bar consists of an accumulation of sea weed, coarse sand, and gravel, apparently formed from deposits from the ebb of the gulf and banked up by the flood and resistance from the sea. It is covered with small knolls of a darker shade than the bottom between them, and, being a little shallower, these are always perceptible unless it blows hard enough to ruffle the water.

**Buoys.**—No leading marks can be given for crossing the bar, but two buoys are supposed to mark the channel; these buoys are very slackly moored to large boulders at the bottom. As the bar alters in position and depth and the passage across it is intricate, great caution is necessary, and a local pilot should always be employed.

**NOTE.**—In July, 1907, Captain H. J. L. Clarke, R.N., H.M.S. *Minerva*, reported the outer buoy to be situated S.  $28^{\circ}$  W., distant 8 cables from the western end of fort Pantakratora, and the inner buoy S.  $42^{\circ}$  E., distant 9 cables from the same point, and E.  $\frac{1}{4}$  N. one mile from the outer buoy.

Both buoys are apparently red, but the colour is not easily identified. The outer buoy is to be left on the port hand, and the inner on the starboard hand on entering.

**Anchorage.**—Vessels generally anchor outside to wait for a pilot, in a depth of 8 or 9 fathoms, with Mytika bluff bearing N.  $\frac{3}{4}$  W. and fort Punta E.  $\frac{3}{4}$  N., distant 2 miles; the bottom is foul. A large vessel should anchor farther out in about 11 fathoms, mud, with Mytika bluff N.  $\frac{1}{2}$  W.

**Current.**—A current is frequently found setting over the bar at the rate of  $2\frac{3}{4}$  miles an hour, changing every six hours, but with strong westerly or easterly winds, its strength and direction are irregular. The rise and fall of tide may be about one foot. See remarks below on tides under the head of *Coast*.

The description of the coast southward of the gulf of Arta is continued at page 302.

Lat.  $38^{\circ} 58' N.$   
Long.  $20^{\circ} 46' E.$

**Port Vathi.**—The mouth of this inlet is half a mile northward of Prevesa and it extends more than half a mile in the same direction, carrying depths of from 8 to 3 fathoms until within a cable of its head, when it becomes shoal. A short distance up the inlet on the east is a fine spring of clear water, near some ancient Roman ruins.

Chart,  
203 [819].

**Prevesa gulf, north shore.—Coast.**—From the entrance of port Vathi, the north shore of Prevesa gulf eastward for 2 miles is a sand and shingle beach in front of a low natural bank, and at the foot of some well-cultivated sloping hills. Along this shore there is plenty of fresh water obtained from wells not far from the beach, and of such good quality that it is sent for from Prevesa. This beach is a common resort for fishermen, who draw their nets on it.

Beyond the sand and shingle beach is a small bay, where, at a few paces in the rear of the beach, is a lagoon abounding in mullet and cockles; and, about a quarter of a mile up the valley is a farm pleasantly situated and surrounded by hills, from which several streams flow and unite at this spot, where they form a small rivulet and run into the lagoon.

**Cape Skara**, the south-eastern extreme of the small bay just mentioned and the southern termination of a peninsula projecting south-eastward  $3\frac{1}{2}$  miles, is 485 feet high, with a tower on it, and is steep-to. The peninsula presents a front nearly a mile wide and having three distinct points, of which cape Skara is the southern, cape Skaphio the eastern, and Myrtavi point the northern.

Chart,  
203 [819].  
Lat.  $38^{\circ} 57' N.$   
Long.  $20^{\circ} 50' E.$   
Var.  $6\ 10\ W.$

**Prevesa gulf.—Southern shore.—Akri bank.**—The low shore of Akri point is bordered on either side by a shallow bank, which, on the eastern side, extends in that direction about a mile, and was reported to be extending in 1907; vessels bound up or down the gulf should be careful in rounding it. No marks can be given, but in steering north-eastward from the anchorage at Prevesa, by keeping about  $1\frac{1}{2}$  cables from the point or one-third the distance across towards Prevesa, a vessel will be nearly in mid-channel between Akri and fort Nuovo shoals. When the minaret in fort Nuovo bears W.  $\frac{1}{4}$  N., keep it on this bearing and it will clear both the Akri bank and the tail of the shoal extending from the northern shore.

Plan,  
1,591 [820].

The shore from Akri point for about 3 miles south-eastward is low and sandy and is the western shore of the Prevesa gulf; farther on, it begins to assume a hilly aspect and inclines more eastward until it reaches two or three small bays. The edge of the Akri bank, which is a mile eastward of Akri tower, gradually inclines towards the shore of the gulf until it terminates near the westernmost of these little bays; the bank should not be approached into less than 8 fathoms water, as it is steep-to.

Chart,  
203 [819].

At the termination of the sand the coast turns northward nearly at a right angle and is a bold, precipitous tongue of land terminating in cape Panaghia, and forming the eastern side of Prevesa gulf.

**GULF OF ARTA.—Guidronisi and Kephalo islets.**—The large basin of the gulf of Arta opens between the two bluff headlands of capes Skara and Panaghia, both of which are steep-to. The small rocky islet of Guidronisi lies a short mile north-eastward of cape Skara, and  $3\frac{1}{2}$  cables from the shore abreast cape Skaphio; it has some rocks on its northern side but deep water around it.

The islet of Kephalo is a short half mile north-eastward of cape Panaghia; a shoal extends from the cape more than half way across to the islet, leaving between them a narrow space with a depth of 17 fathoms. Kephalo is surrounded by a rocky shoal about half a cable wide, but it extends farther at the north-western end, where there is a rock above water at its edge.

**Vonitza bay**, between capes Panaghia and Gheladha, is 2 miles wide and falls back southward about the same distance to the town of Vonitza at its head. It presents a grand and interesting view of the extensive valley stretching away southward, bounded on either side by steep wooded mountains and watered by several streams from their sides. Those which flow through the valley are shaded by the huge branches and foliage of plane trees, affording a cool and refreshing retreat from the scorching rays of the summer sun. These trees are about the size and have the appearance of our largest oaks, and greatly enhance the scenery of the valley.

Lat.  $38^{\circ} 56' N.$   
Long.  $20^{\circ} 54' E.$

The fortress of Vonitza is Venetian and stands on a steep hill on the south-western margin of the bay overlooking the town on the east, fronting

Chart,  
203 [819],  
Var. 6° 10' W.

the bay north-eastward, and on all sides commanding every approach. On the western side of the fortress an extensive lagoon washes the foot of the hill on which it stands.

There is anchorage about half a mile northward of the town in a depth of 7 or 8 fathoms, or at any convenient distance. Vonitza contains about 3,500 inhabitants.

**Water.**—A stream of excellent water runs through the town; its source is in the mountains at the farthest extreme of the valley of Vonitza, and a branch runs into the sea between the town and the little village of Bughat just to the eastward; this is a good place for boats to water. In the fortress are one or two excellent springs of water, which is remarkable, it being on a high rocky hill.

**Cape Gheladha.**—A short distance eastward of Vonitza there is an islet close to the shore; thence the sandy beach from the town continues a quarter of a mile farther, when it turns abruptly northward, and terminates at cape Gheladha, the low eastern point of the bay. The coast here is steep, with several small inlets where boats can beach, deep water all along, and is backed by hills declining from mount Amydros.

Lat. 38° 55' N.  
Long. 20 56 E.

**Mount Amydros**, about 2 miles eastward of Vonitza, is 1,483 feet high, and is the northern height of the range of mountains bounding the eastern side of the Vonitza plain. The view from its summit is very extensive, commanding the gulf beneath with the circling eddies caused by the stream of the Arta and Luro, as well as some of the Ionian islands and the mountains of Suli, Pindus, and Ceta, their tops capped with snow and generally above the clouds; it amply repays for the fatigue of the rugged ascent, especially at sunrise or sunset, when the tints of the distant mountains are rich and varied and their bold outline clearly defined.

**Coast.**—From cape Gheladha to Volimi point, about 3 miles eastward, the coast is bold, but skirted close in-shore by sunken rocks; at first the shore is steep, abrupt, and woody, but it declines towards Volimi point. The soil in several places is thickly covered with dwarf oak and brushwood, but some parts westward of Volimi and near the shore are low and swampy; off these places the water shallows, but deepens again as Volimi point is approached.

**Ruga bay.**—Following the low sandy point of Volimi, is Ruga bay, terminating eastward in Kaliki point, which is again low and sandy like cape Gheladha. Ruga bay, 2 miles wide at the entrance and receding about  $1\frac{1}{2}$  miles, has a depth of 5 to 8 fathoms. On the southern shore, a little removed from the beach, are some extensive ruins on the northern border of a large lake washing their walls. A little farther eastward are some ruins of Roman origin. Near the Roman ruins there is a fine spring of fresh water.

The land bordering the lake inland is hilly and thickly wooded with stunted oak, of which the bark and acorns, called valonia, are articles of commerce used for tanning. In the interior there are forests of large timber. The lake of Ruga abounds in fish, and is the resort of the pelican and other aquatic birds.

**Balim bay.**—Kaliki point is the eastern extreme of Ruga bay, and notwithstanding it is low and sandy, has a depth of 20 fathoms close to it. From thence the shore trends southward for about  $1\frac{1}{2}$  miles to Balim bay. The depth of water along this shore, from 20 fathoms near Kaliki point, shoals suddenly at the same distance off-shore to  $4\frac{1}{2}$  fathoms, but there are no hidden dangers. In about the centre of Balim bay there is good anchorage in 5 fathoms, mud.

Chart,  
203 [819].  
Var.  $6^{\circ} 10' W.$

The country southward and south-westward of the bay is low and swampy for a considerable distance; beyond this, it rises in steep rugged hills and mountains with deep rents and chasms between them.

**Lutraki bay** is the south-eastern part of the bay of which Balim bay is the south-western shore just mentioned leading to Balim bay. It has a snug little basin or cul de sac, like a wet dock, about a mile in circumference, which does not show itself until in the narrow channel leading into it; the eastern and western sides are bounded by steep hills, the interior shore being a shingle beach, and along the western side is a road leading to Missolonghi.

Lat.  $38^{\circ} 53' N.$   
Long.  $21^{\circ} 5' E.$

The shore northward of Lutraki bay gradually declines in height towards Makriamiti point, with a few sandy creeks where boats can beach; it is steep and cliffy, skirted close to by sunken rocks, and can be approached to a prudent distance. The country in the vicinity of Makriamiti point has a rocky sterile appearance, but is covered with stunted shrubs with a few olive trees here and there.

Lat.  $38^{\circ} 55' N.$   
Long.  $21^{\circ} 7' E.$

**Kervasara bay** is in the south-eastern corner of the gulf of Arta; its entrance between Makriamati point and the foot of Mavro Vuni, or Black hill, north-eastward of it, is about 2 miles wide; it runs in south-eastward nearly 4 miles, the coast being bold with deep water throughout, except a 2-fathoms shoal, about 150 yards from the shore at its head, and about a third of a mile eastward of the village of Kervasara; this shoal is said to be the head of an occasionally active submarine volcano. Captain A. Miaulis, of the Greek Royal Navy, reported in 1875 that two eruptions were known to have taken place; one in November 1847, the other in February 1865. Fish were then destroyed in great numbers, and the sea covered with sulphur which floated as far as Prevesa.

Lat.  $38^{\circ} 53' N.$   
Long.  $21^{\circ} 10' E.$

At the head of Kervasara bay, near the village and at the beginning of a deep glen, are the ruins of the ancient city of Limnœa, part of whose walls at the base of the hill are washed by the sea. The ruins consist mainly of two walls of solid rough marble blocks ascending the hill from the beach at an angle of about thirty degrees, and for a considerable way up the hill the walls are perfect. The principal part of the ruins surround the summit of the hill in a circular form with numerous square projecting towers united with each other by the walls. The whole may be about two miles in circumference.

Lat.  $38^{\circ} 52' N.$   
Long.  $21^{\circ} 10' E.$

The road from Albania to Missolonghi winds through the glen, a formidable pass, very narrow, and commanded by craggy fastnesses. Southward of Limnœa is lake Ambrakia, between two chains of mountains, the road dividing and passing on each side of it.

Chart.  
203 [819].  
Var. 6° 10' W.

The neighbourhood of Kervasara is reported to be the most healthy in the gulf, as it is not subject to the malaria so prevalent everywhere else.

Lat. 38° 54' N.  
Long. 21 9 E.

**Light.**—At Phano point, on the western side of Kervasara bay, a *fixed red* light, elevated 45 feet above the sea, is exhibited from an iron post, and is visible in clear weather from a distance of 5 miles.

**East coast.**—Following the eastern shore of Kervasara bay; at 2½ miles from its head is the entrance to Armyro bay, a shallow salt water lagoon a mile in extent east and west, with its narrow mouth open to the southward. From thence, the shore for 3 miles northward, passing the hamlets of Vlika and Arapi, southward and northward of the base of Mavro Vuni, is shoal for nearly half a mile off. The country in the rear is low and swampy, the Kataphorno lake lying just eastward of Arapi.

Along the base of the Makrinoro ridge, the coast is bold and in most places inaccessible except at the foot of the deep ravines between the hills, where a small sandy cove may permit a boat to beach; but, these ravines, as also the hills, are so overgrown with thick tangled underwood as to render a passage through them impracticable. At the northern end of the Makrinoro ridge, and in the north-eastern corner of the gulf, are the Cyclopean ruins of Paleo Pyrgo. The road leading from western Greece to lower Albania runs along the upper part of these acclivities.

**North coast.**—The northern coast of the gulf of Arta is one unvaried but irregular continuation of swamps, marsh, and lagoons, in many places separated only from the water of the gulf by a narrow strip of sand and mud, which, in winter, is overflowed and gives the appearance of a much more extensive area to the gulf than it has in reality, as these lagoons and swamps run a considerable distance towards the higher land. To these swamps and undrained lands may be attributed the baneful malaria which renders this country so unhealthy in summer, and especially in the months of August and September.

Large snakes and reptiles, some of which are venomous, dwell in the rushes of these marshes, and swarms of mosquitos are troublesome, not only here, but in every part of the gulf of Arta.

The lagoons abound in fish and enormous prawns, and are the resort of vast numbers of wild aquatic birds, amongst which are numerous flocks of pelicans.

The rivers Luro (ancient *Charadrus*) and Arta (ancient *Aracthus*) flow through the extensive plains and swamps lying between the gulf and the mountains from whence they take their rise.

The depths all along the northern shore are very irregular and the lead is the only guide when in its vicinity.

Lat. 39° 1' N.  
Long. 21 2 E.

**Arta river.**—This river discharges itself into the gulf about 4½ miles westward of Paleo Pyrgo at the north-eastern corner, winding in serpentine reaches from the city of Arta to its mouth. It is navigable for boats for about 4 miles. The mouth of the river shifts; the old mouth, 2½ miles westward of the present one, is closed by sand and mud.

There are several villages on the banks of the river; Komano, about 3 miles up by the stream, is on the east bank; about 2 miles farther is

Nekhori on the west bank; and 3 miles beyond, on the same bank, is Kalamo. Around these villages are patches of land indifferently cultivated, although the soil beyond the swamps appears to form a rich alluvial bed, highly capable of tillage.

**The city of Arta**, ceded to the Greeks in 1881 and now the capital of the province of Athamania, is on the eastern bank of the river, about  $7\frac{1}{2}$  miles in a direct line from its mouth, but double that distance following all its sinuosities. It occupies a part of the site of ancient *Ambracia*, the remains of which in places are included among the modern Turkish and Greek buildings, more especially in the fort. The regular oblong square stones of immense size, minutely fitting together like brick-work, without cement, and said to be the architecture of the Hellenians, composes the sub-structure of the citadel on which the Venetians raised a fortification, the Turks adding a little of their style of building in the interior of the fort. One of the stones in the eastern wall of the citadel is 15 feet long and 5 feet broad, and most of the others are nearly the same size. The population of Arta may be 15,000.

**LIGHT.**—On **Araklo point**,  $1\frac{1}{2}$  miles eastward of the entrance to Arta river, an *occulting* light, elevated 33 feet above the sea, is exhibited from a cylindrical masonry tower, with dwelling, and shows *red* when bearing from N.  $52^{\circ}$  E., through east, to S.  $37^{\circ}$  E.; *white* in other directions. The *white* light is visible in clear weather from a distance of 10 miles, *red* at 6 miles.

**Korako islets.**—Of the small islets in the gulf, this, the chief group, is between the mouth of the Arta and mount Salagora; they extend about  $1\frac{1}{2}$  miles southward from Pothani point and appear to have been at one time connected with it as they consist wholly of soil. Vuvalos is the largest and southernmost of these islets. Between them and the present mouth of the Arta, the long broken point of Palmatero projects southward with shallow water round it. The low point about  $1\frac{1}{2}$  miles eastward of Palmatero point is said to be growing out in a south-easterly direction. Vessels in this vicinity should be guided by the lead.

**Salagora road.**—This anchorage is  $2\frac{1}{2}$  miles north-westward of the Korako islets and has a depth of  $3\frac{1}{2}$  to 4 fathoms about half a mile from the shore abreast of mount Salagora, the only land of any height bordering the northern shore of the gulf of Arta; at about one mile south of the mount there is a small 3-fathoms patch at the edge of the 5-fathoms contour-line. Eastward of mount Salagora is lake Logaru, and, westward of it, lake Zukalia, both separated from the waters of the gulf by only a narrow sandy beach.

**Luro river.**—This river is a rapid stream finding its way into the gulf through a swamp westward of lake Zukalia. About 7 miles from its mouth, where there is a ferry, the river is rapid and 100 yards wide.

**Nicopolis bay.**—A little southward of the mouth of the Luro, a ridge from the hills northward of Nicopolis reaches the sea with grassy cliffs and beach at their foot; then follows a long narrow spit projecting southward and nearly closing in Mazoma lagoon in which fish are plentiful, leaving only a small opening. The ruins of Nicopolis are seen across the lagoon. From thence, a precipitous and bold shore trends south-eastward about 4 miles to Myrtavi point, north side of inner entrance to Prevesa gulf.

Chart,  
203 [819].  
Plan,  
1,600 [821].  
Lat. 38° 52' N.  
Long. 20 47 E.  
Var. 6 10 W.

**COAST.—PORT SAN NIKOLO.**—Between Skilee point at the entrance to Prevesa strait and cape Yero-Tripa in Santa Maura island, 5½ miles distant, the coast forms the deep indentation, Demata bay, in the eastern part of which is port San Nikolo and in its southern part the roadstead of Santa Maura. From Prevesa strait, the low flat land continues southward bordered by rocks and shallow water extending some distance off, the 5-fathoms line of soundings being in places a long mile from the shore. At 2 miles southward of Skilee point, the low land becomes marshy and recedes eastward, forming a large bight about 2 miles deep, choked with rocks and shallow water, but leaving in the interior the circular space named port San Nikolo, three-quarters of a mile indiameter, with 3½ to 4 fathoms, mud bottom, and excellent holding ground, but available only for small coasting craft and fishing boats acquainted with the shallow passages through the reefs and shoals.

At the head of port San Nikolo, between a sandy spit projecting southward from the low marshy land on the north, and a bluff point 60 feet high on the south, is the entrance into Chelovero harbour, a shallow area abounding in fish. The shore northward of Chelovero harbour is sandy, with off-lying rocks.

**Plaka spit.**—The entrance to port San Nikolo is protected on its southern side by Plaka spit, a narrow ridge of conglomerate rock about a mile or more in length and a foot above water, which projects northward and near its termination trends eastward. From the shoulder of this spit, a reef extends 4 cables in a northerly direction and terminates in a ridge of huge boulders which form the margin of the surf and breakers in strong north-westerly winds.

The conglomerate formation here mentioned is seen also at cape Yero-Tripa, the north extreme of Santa Maura, from whence it skirts the coast eastward and northward to the strait of Prevesa; in places it is broken, forming numerous rocks and the small islets Doozinani, Achiloo, and Jefti, the two latter awash and on the northern side of entrance to the bight. This conglomerate rock is useful in the construction of moles and works subject to the wash of the sea.

Lat. 38° 52' N.  
Long. 20 46 E.

**Doozinani rock.—Beacon.**—Doozinani rock has on its northern end a beacon, being the basement of a lighthouse that formerly existed to mark the southern side of the entrance to port San Nikolo. This rock lies 6 cables north-eastward from the Lazaretto on San Nikolo islet, which latter is within the Plaka spit. At 5 cables northward of Doozinani is Achiloo rock (awash); between the two is the entrance to port San Nikolo, with 2 to 3 fathoms water, but the channels over the bar within are tortuous and shallow, not being more than from 6 to 8 feet deep.

Vessels working up to Santa Maura roadstead in the vicinity of these dangers should not stand into less than 8 fathoms water, and should keep mount Lamiah well open southward of the houses of the lazaretto on San Nikolo islet. A bearing of the lighthouse on Santa Maura mole will also indicate a vessel's approach to these rocks.

The sea breeze forces a considerable quantity of water into the bight of San Nikolo which, at sunset, when the breeze dies away, runs out with some strength.

**SANTA MAURA.—General remarks.**—The island of Santa Maura, ancient *Leucas*, is rather less than 19 miles in length, and its extreme breadth 8 miles. A lofty limestone ridge stretches the whole length of the island with several spurs or ridges extending eastward; the highest and most southern elevation, mount Stavrota,\* has a double top and being 3,700 feet above the sea is conspicuous from the northward and westward. During winter, the highest mountains are generally capped with snow.

Plan of Santa Maura, 1,809 [821].  
Chart, 203 [819].  
Var. 6° 10' W.  
\*Lat. 38° 41' N.  
Long. 20 38 E.

Vegetation generally is good, but is scanty near the summits of the heights. The island has several rich fertile plains, of which the largest extends westward and southward from Santa Maura or Amaxiki, the capital town, at the north-eastern end of the island. The town is surrounded on three sides by an extensive shallow lagoon with large salterns in the neighbourhood on its south-eastern side. The island produces a large crop of olives; its principal productions are oil and wine, wheat and maize, and a quantity of salt. Traces of quicksilver have been found near mount Stavrota.

The climate is good, except along the north-eastern shore, where it is very unhealthy, intermittent fever prevailing during the summer months. Earthquakes are prevalent during the hot months, but are slight and scarcely perceptible, their frequency perhaps accounting for the rarity of any severe shock.

**The population** of the island, amounting to 29,892 in 1896, are a hardworking, quiet, and hospitable race, husbandry being their chief occupation; a few are fishermen, and as a rule they are in favour of a seafaring life. There are 15 churches in the town of Santa Maura, which has a population of 8,500.

**Santa Maura Citadel**, erected on the narrow strip of low ground which encloses the lagoon and once capable of offering considerable resistance, is now dismantled and useless. It covers a large space and shows evident signs of its numerous masters in its various materials, and in its construction and outworks. Within it is a building formerly a Turkish mosque which afterwards became a Christian church and then a Government storehouse.

**LIGHTS.—Citadel.**—On the north battlement of the Citadel at Santa Maura stands a square tower, 24 feet high, from which, at an elevation of 57 feet above high water, is exhibited a *fixed light*, visible in clear weather from a distance of 13 miles, showing *red* when bearing from N. 81° E., through east, to S. 54° E.; *white* from S. 54° E., through south, to S. 81° W.; obscured elsewhere.

Lat. 38° 50' N.  
Long. 20 44 E.

**Mole.**—At the end of Santa Maura mole, from an iron support, a *fixed green light* is exhibited at an elevation of 24 feet above the sea, visible in clear weather from a distance of 4 miles.

**Mole and Roadstead.**—About half a cable westward of the citadel, a well-constructed mole projects about 2 cables north-eastward, thence half a cable eastward, covering a small area and giving shelter to small vessels from north-westerly winds; along the mole are bollards for making fast, and by dropping an anchor to the north-eastward a vessel can haul in and secure to it. Small coasting craft haul into the canal under the citadel. On the western side of the citadel, between it and the mole, is a causeway leading to the town, distant about three-quarters of a mile.

During fine weather in summer, vessels find temporary anchorage in the open roadstead in a depth of about 8 fathoms, a short half mile N.N.W. of the Citadel lighthouse. A large vessel should anchor farther out in 12 to

Plan of Santa Maura, 1,609 [821]. Chart, 203 [819]. Var. 6° 10' W.

15 fathoms. This anchorage is open to northerly or north-westerly winds, which send in a heavy sea.

**Winds.**—Land and sea breezes are very regular in summer; the former blow from about 10h. p.m. until 5h. a.m.; the latter set in about 10h. a.m. and cease about 7h. p.m., with calms during the intervals. Frequent thunderstorms occur, especially about the equinoxes, when heavy squalls may be expected from the hills and mountains.

**Telegraph cable.**—The cable connecting Santa Maura with Corfu is landed westward of the roadstead.

**The Harbour** of Santa Maura is approached by the narrow channel between the mole and citadel, on the eastern side of which is a stone breakwater about 2 feet high; in the harbour there is a depth of 15 to 18 feet, and a jetty with crane and bollards. Vessels secure with their sterns to the wall.

**Santa Maura canal,** between the island of Santa Maura and the mainland connects Santa Maura roadstead with port Drepano, and is navigable for vessels of 14 feet draught, the depth in the middle of the canal being maintained by dredging to 15 feet. The channel is marked on each side by beacons, and is clearly defined by the colour of the water: which is dark green in the deepest part and light yellow on the shallows. For details, *see* page 308.

Lat. 38° 51' N.  
Long. 20 42 E.

**COAST.**—From the mole of Santa Maura to cape Yero-Tripa or Windmill point, 1½ miles westward, the shore is a shingle beach which in most parts has become compact and solid rock as before explained. Cape Yero-Tripa is the northern extreme of Santa Maura island, and the north-eastern point of Flayva bay; the point is foul to a quarter of a mile off and should have a wide berth. Extending along the beach of the bay for about a mile southward of cape Yero-Tripa are several windmills.

Lat. 38° 50' N.  
Long. 20 40 E.  
Chart, 203 [819].

**Cape Zuana,** 2 miles south-westward of cape Yero-Tripa, and the south-western point of Flayva bay, is a bold cliffy headland, and, except a few sunken rocks skirting the shore close in, is clear of danger. At about 3 miles southward of the cape is a bluff promontory forming the inlet of Santa Nikita, open to the northward, which in fine weather may be used by boats; thence the high coast continues southward, trending southward, 14 miles to cape Dukato. At 2 miles southward of Sesola islet, it becomes broken and assumes a whitish appearance, to which circumstances the south-western promontory of Santa Maura owes its ancient name of *Leukas*; it terminates in cape Dukato.

The coast is skirted here and there by sunken rocks and also by some above water, at a distance of a cable. At 2 miles northward of cape Dukato is a remarkable triangular white cliff, about 780 feet high celebrated as the famous *Sappho's leap*.

Lat. 38° 41' N.  
Long. 20 33 E.

**Sesola rock.**—This rock, 9½ miles from cape Zuana and 1½ miles from the coast, is triangular in form, 2 cables in extent, 114 feet high, and perpendicular on its south-western and south-eastern sides, where many huge rocky fragments show above water close-to. The islet slopes to the northward where it is foul for about a cable, and is perforated at the southern end; in the channel between Sesola and the shore the depth is about 60 fathoms.

Lat. 38° 33' N.  
Long. 20 33 E.

**CAPE DUKATO,** the south-west extreme of Santa Maura, is bold and, with the exception presently described, steep-to; a little eastward of it is a small dark islet or rock. The current near the cape is often very perceptible.

**Shoal.**—At  $1\frac{1}{2}$  cables S. by E. from cape Dukato is a shoal Chart,  
203 [819].  
Var. 6° 10' W.  
 $1\frac{1}{2}$  cables in diameter consisting of rocky pinnacles having a least known depth of 5 fathoms, with 30 fathoms around it. In 1882, the Greek revenue steamer *Cephalonia* reported a shoal half a mile south-westward of cape Dukato with as little as 13 feet; this was unsuccessfully searched for by H.M. ships *Superb* and *Hecla* and no trace of shoal water discovered in that direction. In the early part of 1883, however, H.M.S. *Téméraire*, in examining this locality, discovered the shoal now described which is probably identical with that discovered by the Greek steamer, though differing considerably both in depth and position from her report.

**LIGHT.**—From a square lighthouse 44 feet in height, with keeper's dwelling near it, situated 382 yards north-eastward of cape Dukato, is exhibited at an elevation of 229 feet above the sea a *fixed white* light varied by a *white flash of ten seconds* duration once *every minute*; it is visible when bearing from S.  $1^{\circ}$  W., through east and north, to S.  $73^{\circ}$  W., and in clear weather the *fixed* light should be seen from a distance of 20 miles, and the *flashing* light at 22 miles.

Near the above limits of the arc of visibility the flashes are weak and of short duration, increasing quickly in intensity, but gradually in duration, and are complete from S.  $16^{\circ}$  E., through east, to West.

The light is obscured over Sesola rock, but a faint *fixed* light may be seen to the distance of 8 miles in this obscured sector. The glare of the *fixed* light may be seen from the upper part of Vasilico bay. Reported irregular, March, 1905.

**Vasilico bay.**—The promontory terminating in cape Dukato forms the western side of Vasilico bay, and is all along bold and steep-to. The bay recedes about 4 miles and affords excellent shelter, the best anchorage being off the centre of the sandy beach at its head, in a depth of 12 to 15 fathoms, sand; closer in, the water suddenly shoals from 7 to 2 fathoms. A good berth may also be found about half a mile westward of the little mole on the eastern side of the bay, in 10 fathoms, mud. The mole affords shelter to country boats during southerly winds. The bay terminates on the east in Lipso point nearly 5 miles east of cape Dukato. Lat.  $38^{\circ} 37'$  N.  
Long.  $20^{\circ} 37'$  E.

**Light.**—A small *fixed red* light, visible from a distance of 2 miles, is shown from a stone column on Vasilico molehead, at the north-eastern shore of the bay. Its exhibition is not, however, to be relied on.

There is a watering place formed by a stream which turns a mill near the sea, about a quarter of a mile southward of the mole; a supply may be obtained by leading a hose into the boat. A small stream also runs through the valley into the sea at the head of the bay.

**The Telegraph cable** connecting Santa Maura and Ithaca leaves the shore near the mole and is landed in Aphales bay in Ithaca.

**Coast.**—From Lipso point to the south-eastern extreme of mount Porro, the coast is irregular, high, and bold, and within this space are included the three bays of Aphteli, Sivota, and Ruda. Lat.  $38^{\circ} 34'$  N.  
Long.  $20^{\circ} 39'$  E.

Sivota has good shelter for coasting vessels at its head; in the other two, and in the entrance of Sivota bay, the water is too deep for anchoring. Mount Porro, 1,670 feet above the sea, which rises on the eastern side over the head of Ruda bay, is  $1\frac{1}{2}$  miles from its southern termination. The high and bold coast of Santa Maura now turns Plan of Meganisi  
channel on  
1,620 [823].

Chart. 203 [819].  
Var. 6° 10' W.

northward, the narrow deep channel of Meganisi separating it from the island of that name.

Lat. 38° 33' N.  
Long. 20 43 E.

**Arkudi island** is separated from Lipso point by a channel 2½ miles wide, and, from Marmaka point at the northern end of Ithaca, by a passage 3 miles wide. Arkudi is nearly 2 miles in length north and south, a mile in width and 441 feet high on its western side, the eastern part being flat. Its shores are rocky and steep-to, but a sunken rock is charted about 2 cables off its south-eastern point. The island affords pasturage for a few sheep and goats.

**Caution.**—In 1869, Her Majesty's ship *Bellerophon*, in rounding the southern end of Arkudi, was supposed to have grazed the rock just mentioned at about 2 cables S.E. by S. from the southern point of the island. Although a subsequent search for the rock was fruitless, mariners are cautioned not to approach the salient points of the islands and coast in this sea too closely.

Plan of Meganisi  
channel on  
1,620 [823].

**Meganisi island** is very irregular in form, the main portion extending 3½ miles east and west and about 1½ miles in breadth; but at the south-western end of this part, a long narrow strip of land projecting nearly 4 miles south-eastward terminates in cape Kephali,\* and forms with the main portion of the island a deep bight with its extreme points to the eastward; the shores of this bight are everywhere bold and the water deep. The island is hilly and the valleys cultivated; the hills range from 200 feet in height at its north-eastern part, to 874 feet high at the south-western part.

On the northern and north-eastern sides of the island are several deep inlets, with accommodation for coasting vessels. The two chief anchorages are ports Spiglia and Vathy, with the villages of Spartokori and Vathy at their heads; another village is on the south-eastern side of the island. There are about 1,000 inhabitants who are generally poor. Water is scarce.

Lat. 38° 38' N.  
Long. 20 49 E.

Two small islets or rocks, from 20 to 24 feet high, lie off the point which divides Abelike bay from port Atheni, on the north-eastern side of the island, and are connected with it by reefs; a sunken rock also lies close to the shore of Elia point south-eastward of the former; the coast elsewhere has no outlying danger.

**Kithro island**, just westward of cape Kephali, is a mile in length, its extreme breadth about 4 cables, and its height 300 feet; its coast is irregular, steep, and surrounded by a bank, which extends a quarter of a mile off-shore round its western point, where there is a depth of from 5 to 17 fathoms. A small quantity of corn is grown on the island. Between it and the south-western side of cape Kephali is a channel only 1½ cables wide but with 30 to 50 fathoms in the fairway.

Petalis islet, three-quarters of a mile north-westward of Kithro island, is a barren rock 8 feet above water and about a cable in diameter; it is surrounded by a rocky bank with from 7 to 20 fathoms on it, outside of which the water is deep.

Lat. 38° 38' N.  
Long. 20 45 E.

**MEGANISI CHANNEL** has its southern entrance between the island of this name and Santa Maura, a width of about half a mile with from 25 to 50 fathoms water. Northward of the north-western end of Meganisi, the channel is divided by Skropio island, one part following its original direction northward between that island and Santa Maura; the other passing out eastward between Skropio and Meganisi.

The clifty coast of Meganisi in the southern and narrowest part of the channel, is followed by a low shore bordered by a bank, on the southern part of which, nearly a cable from the shore, there is but  $2\frac{1}{2}$  fathoms water. On this bank, three-quarters of a mile farther northward, is Tiglia islet, 30 feet high, with its northern part only about a cable from Meganisi island; its southern point is foul for a cable off-shore and the shallow water continues along its eastern side.

There is anchorage for small vessels between Tiglia islet and Meganisi in 10 to 12 fathoms, sandy bottom. The channel through to the northward carries 19 fathoms past the foot of One tree hill, 521 feet high, at the north-western end of Meganisi. The shore of Santa Maura is high, bold, and clear of danger.

**Skropio island** is about 2 miles in circumference, hilly, and 186 feet high; its shores are irregular and shallow water surrounds the north-western point. The little islet of Sokava, on the western side of Skropio, with rocks extending northward and southward of it, rises from the bank which surrounds Skropio except round its eastern end. Between the islet and the coast of Santa Maura, the channel, a continuation of the Meganisi channel, is nearly half a mile wide, and has a depth of 35 to 40 fathoms.

Plan on  
1,620 [823].  
Chart, 203 [819].  
Var. 6° 10' W.

On the northern side of Skropio, a long cable from its north-western extreme and in front of a bay, is the smaller island of Skropidi, with 10 fathoms water in the channel between them.

**Hieromiti shoals** are three rocky patches in the eastern entrance to the Meganisi channel, nearly midway between Skropio island and the entrance to port Vathy in Meganisi island; the two patches nearest to Skropio have only 3 feet water over them, are about a cable apart, and each distant about half a mile from Kastri point of that island, bearing from it respectively E. by S.  $\frac{3}{4}$  S. and S.E. by E.  $\frac{5}{8}$  E.; the third patch with 2 fathoms water, is  $3\frac{1}{2}$  cables from the other two, nearer port Vathy, being 6 cables from its north-eastern point of entrance and bearing N.W. by W.  $\frac{7}{8}$  W. from Macria point, Meganisi. These dangers are steep-to.

One-tree hill, a peak at the north-western end of Meganisi, bearing S.W.  $\frac{3}{4}$  W. and in line with the southern shoulder or fall of mount Porro, leads south-eastward of Hieromiti shoals. See view A on plan No. 1,620.

**Sparti island**, northward of Skropio and half a mile from the shore of Santa Maura, is three-quarters of a mile in length, about 180 feet high, bold, and steep-to on its south-eastern side; but a bank extends a quarter of a mile westward from its south-western part, on which is a rocky 7-feet patch with deep water close to it.

Between the south-western end of Sparti and the entrance to port Vliko is the little round island of Moodra, about 2 cables in diameter and 145 feet high. The passage into port Vliko is on either side of this latter island.

The rock or islet of Socava, 60 feet high, is  $3\frac{1}{2}$  cables northward of Moodra and nearly  $1\frac{1}{2}$  cables from the shore of Santa Maura; the passage between this islet and the  $1\frac{1}{4}$ -fathoms patch off Sparti island is 3 cables wide. See view of entrance to port Vliko from the North-east on plan No. 1,620.

**Port Vliko**, on the Santa Maura shore abreast Skropio island, is nearly oval in shape, being over a mile in length north and south, and half a mile in breadth; it is bordered all round by a bank, which, at its

Lat. 38° 42' N.  
Long. 20 45 E.

Lat. 38° 41' N.  
Long. 20 43 E.

Plan on  
1,620 [823].  
Chart, 203 [819].  
Var. 6° 10' W.

head, where the ground is marshy, extends off shallow for a quarter of a mile, but in the centre of the port there is a depth of 4 fathoms, mud bottom. It is surrounded by high land, which, with the marshy ground and confined position, sheltered from all winds, causes fevers during the summer months. In the south-western part are some houses, a Custom-house and health office.

The entrance to the port is through a narrow channel carrying 4 fathoms water and about three-quarters of a mile in length; in the port the depth is 4 fathoms, as above stated.

From port Vliko northward, the coast is bordered by a bank, which, in places, is shallow  $1\frac{1}{2}$  cables off; and Mara point with the coast beyond it, is skirted by rocks.

Plan,  
1,609 [821].  
Lat. 38° 46' N.  
Long. 20 45 E.

**PORT DREPANO** is the bay included between the north-eastern part of Santa Maura and the mainland; it is 3 miles deep, with an average breadth of  $1\frac{1}{2}$  miles.

The anchorage at its head is in a depth of 7 to 12 fathoms, good holding ground, south-westward of the white fort of St. Giorgios which stands on a hill on the mainland and is 150 feet high. The small white rocky islet 16 feet high named Observatory island lies at the base of the hill, from which a sunken mole extends westward. On the opposite or Santa Maura side the remains of an ancient mole project eastward; at the extreme of each mole is a white stone pillar, about 5 feet high, marking the channel into the inner anchorage, which is used by small vessels loading with salt from the extensive salterns in the vicinity. The channel has from 4 to 3 fathoms water decreasing to 2 fathoms about  $1\frac{1}{2}$  cables inside.

A good road leads to the town of Santa Maura where there is a telegraph station.

A steam vessel calls here from Patras weekly.

**Santa Maura canal.—Directions.**—The canal between ports Drepano and Santa Maura roadstead is navigable for vessels drawing 14 feet water, the least depth in the centre of the channel, 15 feet, will be maintained by dredging.

Pass between the two stone pillars marking the mole-ends, then between two posts with cross-pieces, and enter the canal between the piles of stones marking either side. The channel between the piles of stones and through the Salterns is narrow, and curves slightly westward; opposite Paleo Khalia the west bank ceases and the channel thence, marked on either side by posts with cross-pieces at frequent intervals, runs direct to Santa Maura. It is clearly defined by the colour of the water, which is dark green in the centre, whilst at the sides it is light yellow.

A stone containing-wall extends some distance on the east side of the channel southward from Santa Maura town, which should not be too closely approached.

This channel is regularly used by the mail steamers.

Lat. 38° 45' N.  
Long. 20 47 E.

**Kephali point**, the south-eastern extreme of port Drepano, is 35 feet high, bold, projecting, and skirted by rocks; the coast between it and the port is high and covered with brushwood. Kephali point is the south-western termination of mount Saussi, which, at  $3\frac{1}{2}$  miles inland, rises 1,650 feet above the sea. A long half mile eastward of the point is Vathi Vali bay, open to south-westerly winds and about half a mile deep, shoaling from 16 fathoms water at the entrance to 3 fathoms at two-thirds of the distance in.

**Miaulis rock**, about a cable in extent and steep-to, lies off the western point of entrance to Vathi Vali bay, and its shoalest spot of  $1\frac{1}{2}$  fathoms is 3 cables from the nearest shore, with Kephali point bearing N.W.  $\frac{3}{4}$  N. distant 5 cables. There are depths of from 16 to 23 fathoms between it and the shore.

**St. Nikolo islet**.—At 6 cables eastward of Parathera point, the eastern point of Vathi Vali bay is the islet of St. Nikolo, about 2 cables in circumference and 67 feet high, with a chapel on it; the islet is surrounded by a bank which, on its south-western side, extends a cable off-shore, with 6 fathoms water.

**Varcos bay**.—North-eastward of the islet is Varcos bay, with cultivated land and a beach at its head, off which in the north-eastern corner, small vessels anchor in about 5 fathoms water, sheltered from south-easterly winds by cape Varcos the projecting eastern point.

**Zaverda bay**.—Cape Varcos is the western extreme of Zaverda bay; the distance from the cape to the coast on the opposite side of the bay abreast mount Kandili is 4 miles, and from this line the bay recedes 3 miles. About three-quarters of a mile north-eastward of cape Varcos, and near the shore, are the Poghonia rocky islets. The shore at the head of the bay is an extensive beach and the water shoals some distance off all round the bay, especially in the north-western part. The cultivated valley or plain in its rear is the southern end of the plain extending northward nearly 8 miles to Vonitza in the gulf of Arta.

The village of Zaverda is near the shore on the eastern side at the head of the bay; and, behind it, on an elevated plain, are several houses with gardens. The anchorage is off the beach north-westward of the village in a depth of 10 fathoms, mud. A steam vessel calls here weekly from Santa Maura and Patras.

**Cape Kamilafka**.—From the village of Zaverda, the coast trends southward in nearly a straight line to cape Kamilafka, a distance of 7 miles; the first part of the shore is bordered by a narrow bank, but when southward of mount Kandili it is generally steep-to. The land rises in steep limestone ridges to Mount Kandili which, at  $1\frac{1}{2}$  miles inland, is 3,845 feet above the sea; its summit slopes gradually to the southward for  $4\frac{1}{2}$  miles to cape Kamilafka, which has on its eastern side a sandy bay named port Alyzia, where vessels anchor in depths of 8 to 10 fathoms, sand. Cape Kamilafka should not be approached nearer than 3 cables, the depths off it being irregular.

**Vurko bay**.—Mytika point, one mile south-eastward of cape Kamilafka, forming the eastern boundary to port Alyzia and the western extreme of Vurko bay, is low, sandy, steep-to, and has on it the village of Mytika. Vurko bay extends eastward 2 miles from Mytika point, and has a sandy beach bordered by a bank off which the water deepens suddenly; behind the coast of both bays is an extensive cultivated plain, beyond which the mountains rise abruptly; the three principal peaks being mount Bumisto, 5,172 feet high, mount Korphi,  $2\frac{1}{2}$  miles to the north-west, with an elevation of 5,252 feet, and mount Kavrulia, 4,605 feet high.

**Communication**.—Mytika has regular steam communication with Patras, &c. There is overland telegraph connection by Zaverda and Astacos with the European system.

Chart,  
3,496 [814].  
Var. 6° 0' W.

**Supplies** are obtainable in small quantities.

**Anchorage.**—Vurko bay affords excellent anchorage, well sheltered from south-westerly winds by Kalomo island, in depths of about 12 to 15 fathoms, sand, from 5 to 8 cables eastward of Mytika point, with the eastern extremes of Kalomo and Dragonera islands nearly in line, and cape Kamilafka being in line or just shut in with Mytika point.

The approach to Vurko bay between Mytik point and the northern end of Kalomo island is about 7 cables wide with depths of 25 fathoms in the centre. Westerly winds, unless strong, do not reach the anchorage, but back round Kalomo island from the south-eastward, thus heading a sailing vessel standing in for the anchorage. A weak current sets eastward.

**Kalomo island** is 6 miles in length, in a north-east and south-west direction, with an extreme breadth of  $2\frac{1}{4}$  miles; but at  $1\frac{1}{4}$  miles from the southern end, it is nearly divided into two parts connected by a narrow neck; the northern portion of the island is somewhat oval in shape; a mountainous ridge extends along its whole length.

Lat. 38° 38' N.  
Long. 20 56 E.

Mount Kalomo, its summit situated near the middle of the island, is flat-topped, and 2,445 feet high. Equidistant from it on either side ( $1\frac{1}{2}$  miles) are the conspicuous mounts Vuni and Xilo Castro.

The land falls sharply northward of mount Kalomo, rising again to nearly the same height in a uniform slope to mount Vuni, 2,225 feet high, overlooking cape Aspro Gali; southward of mount Kalomo the slope is more gradual to mount Xilo Castro, 1,950 feet high, beyond which the land again falls abruptly. The southern portion of the island is much lower, its highest part, nearly one mile northward of cape Kephali, being 890 feet high. The coast is bold and generally steep-to all round, and may be approached safely anywhere to within a quarter of a mile.

The north-eastern end of Kalomo is separated from the coast eastward of it by a channel nearly  $1\frac{1}{4}$  miles wide, but narrowed by the Low rocks, a group 3 feet high, extending 3 cables from the mainland; between these rocks and Kalomo, the depth is over 20 fathoms.

**Town.**—**Anchorage.**—Kalomo is cultivated and produces excellent wine. The town of the same name on its eastern side, has a rudely constructed mole, small in extent, with 3 fathoms water within it, affording accommodation for a few small vessels. There is anchorage north-eastward of the mole in 8 or 9 fathoms, but only 2 cables from the beach. Heavy squalls, even in summer, blow from the high land in the neighbourhood, and a good scope of cable is necessary.

For any lengthened stay a more protected anchorage, though in deep water, is afforded near mid-channel westward of Provati islet, where the depths diminish to 30 fathoms; the small indentation of the coast forming port Leone, affords shelter for coasters only.

**Kastus island**,  $4\frac{1}{4}$  miles long in a north-east and south-west direction, with a greatest breadth of a little over half a mile, is partly cultivated; numerous hills studded with valonia oaks extend throughout its entire length and attain a maximum height of 520 feet near the centre. Its western shore is nearly straight, and trends nearly parallel to the east coast of Kalomo island with a deep clear channel between the islands; the southern and eastern shores are irregular, forming many inlets, only suitable for small coasters.

Lat. 38° 34' N.  
Long. 20 55 E.

Port Saraceniko on the west side of Kastus (which has a small islet near its head), and port Kastus nearly abreast to it on the east side of

the island, where the village of that name is situated, are those principally used; the mill on the top of the low ridge separating them, appears conspicuously on the sky line and serves to point them out.

Chart,  
3,496 [814].  
Var. 6° 0' W.

Prasons islet, 26 feet high, covered with low scrub, lies close off the middle of the eastern side of Kastus. Provati islet, 140 feet high, is 250 yards from its northern end, with deep water between these two latter. Provati islet is 6 cables from the nearest part of Kalomo island, off which are some conspicuous rocks, 5 feet high.

**Formicula islet and shoal.**—Nearly a mile south-west from cape Kephalia at the southern end of Kalomo island, is the islet of Formicula, 45 feet high, flat-topped and nearly 4 cables in length, and with a depth of 30 fathoms in mid-channel between them. A large rock above water lies off the south-eastern point of the islet, and another close to its north-eastern point.

Lat. 38° 34' N.  
Long. 20 51 E.

Formicula shoal, situated one mile W.  $\frac{1}{4}$  N. from the southern extreme of Kalomo island and N. by W. 7 cables from the north-eastern point of Formicula islet, is about  $2\frac{1}{2}$  cables in length and half a cable in breadth, with a least depth of 2 fathoms, rock, sand, and shells; a quarter of a mile W.S.W. of it, is a 5-fathoms patch, steep-to.

The mill on Kastus island on with the south extreme of Kalomo, bearing S. 64° E., leads northward of the shoals; the whole of Vromona island open south-westward of Formicula islet leads westward of them.

**Atoko island**, 1,095 feet high, 2 miles in length north-east and south-west,  $1\frac{1}{4}$  miles in breadth, and steep-to all round, is situated  $3\frac{1}{2}$  miles from Formicula islet. Its three conspicuous peaks, all nearly the same height and situated near the extremes, form excellent landmarks, the two highest being near the southern end.

Lat. 38° 29' N.  
Long. 20 49 E.

The island is mostly covered with brushwood, but a portion is cultivated, and a few sheep and goats find pasturage. On the southern side is a bay, where there is a well of fresh water and a small church.

**COAST.**—**Cape Turkovekla (Marathia).**—From the eastern end of Vurko bay the coast trends southward for 10 miles to cape Turkovekla, 447 feet high, with an abrupt slope, forming the west point of entrance to Dragamesti bay. With the exception of the Low rocks south east of Vurko bay, the coast is, in general, steep-to, with a few off-lying rocks all close inshore, the land behind being thickly covered with wild olive and valonia oak trees, and backed by high mountainous country, sparsely inhabited.

Lat. 38° 30' N.  
Long. 21 2 E.  
Plan of Dragamesti bay,  
1,939 [824].

Cape Turkovekla is steep-to, and the channel between it and Kaloyeros islet is clear of danger.

From cape Turkovekla the coast turns sharply into the little bay of Marathia, half a mile broad and deep. From Metaxoto, the eastern point, the general direction is north-easterly to the head of Dragamesti bay.

**Aspect.**—The appearance of the country bordering the sea is hilly for 5 miles to the southward of cape Turkovekla; it then changes to flat marshy plain, from which rise abruptly a succession of small hilly tracts, similar in appearance to the islands which front the coast.

**DRAGONERA ISLANDS.**—Dragonera is the general name for the numerous small islands and rocks off the entrance of Dragamesti bay, which they shelter from south-westerly winds and sea. They extend over a space of  $4\frac{1}{2}$  miles north and south, about 5 miles east and west, and are

Charts,  
3,496 [814].  
1,676 [826].

Chart,  
3,496 [814].  
Var. 6° W.

in general steep-to with navigable channels between. The islands are covered with large stones and scrub with a few wild olive trees, are very hilly and rise steeply from the water; cultivation in patches is carried on during some months of the year on all but the smallest islands, water being obtained from the storage tanks.

Lat. 38° 29' N.  
Long. 20 59 E.

**Prasa island**, the westernmost of the group, 42 feet high, circular in shape, and 150 yards in diameter, is destitute of vegetation, and composed of rocks and boulders. The island may be approached with safety to the distance of a quarter of a mile, except from the north-eastward, in which direction a narrow rocky ridge extends for 8 cables with irregular depths terminating in the Prasa shoal.

**Prasa shoal**, a rocky head having a depth of 5 fathoms with deep water immediately to the northward of it, is situated with the centre of Prasa island bearing S. 24° W., distant 7 cables, and the north extreme of Dragonera island S. 80° E.

This shoal is connected with Prasa island by the narrow ledge mentioned above, on which the depths are from 11 to 18 fathoms.

**Venerable banks** comprise some small detached rocky patches, with general depths of 11 to 14 fathoms and a least depth of 7 fathoms, situated between 2 and 3 miles northward of Prasa island; they stand on a raised plateau embraced by the 30-fathoms contour-line, beyond which the water soon deepens on all sides. Custance shoal of 7 fathoms, the shoalest head, lies with the centre of Prasa island bearing S. 10° E. distant 2½ miles, and mount Velutzi N. 76° E. The northernmost patches lie about half a mile north-west of this spot with least depths of 11 to 12 fathoms.

**Caution.**—Much time was devoted to a careful examination of this locality in 1904, yet, from the sudden manner in which all these heads rise amidst the general deep water surrounding them, it is possible that other heads may exist, and it would be prudent for heavy draught ships to avoid this area. There is a clear channel over a mile wide between the southernmost of these patches and the Prasa shoal, when entering Dragamesti bay from the westward.

**Clearing marks.**—Oxia peak in line with Prasa island, bearing S. 27° E., leads westward, and the west extreme of Stamothi and Lambrino islands in line, bearing S. 12° E., leads eastward of the Venerable banks.

**Dragonera**, the largest of the group, is 1½ miles in length from north to south, and about the same in breadth, the coast-line being considerably indented; the highest point is 422 feet\* above the sea. Dragonera, with the islet of Kaloyeros, forms the southern side of the northern passage into Dragamesti bay.

**Grant and Davy banks**, with least depths of 7 fathoms on them, are situated, respectively, 8 and 3 cables off the north extreme of Dragonera island, and lie in the track of vessels entering Dragamesti bay from the northward and westward. There is a deep passage of a half a mile wide between them, attention to the bearing of cape Turkovekla being the principal guide in avoiding them.

**Clearing marks.**—The east extremes of Kaloyeros and Pondiko islands in line, bearing S. 36° E., leads eastward, and the west extremes of Sophia and Vromona islands in line, bearing S. 9° W. leads well westward of both these shoals.

**Kaloyeros** is 128 feet high, about 2 cables in extent, and separated from Dragonera by a channel about 2 cables in width; off the southern



No. 1873.—KAIOWEROO ISLAND—LIGHT ESTABLISHMENT.

Position.—On the eastern side of the 128 fathoms reef, situated near the northern end of the island.

Details:

Apparatus.—A revolving light with every three seconds

Revolving light—120° and 12.

Revolving light—120° and 12.

Revolving light—120° and 12.

Revolving light—120° and 12.

Remarks.—The light will be unwatched.

Chart No. 1900. Med. S. pp. 313, 314, 316.

point a shallow spit extends for three-quarters of a cable. Westward and south-west of Dragonera are the islands Sophia, 145 feet high, Lambrino, 205 feet, Filipos, 95 feet, and Pistros, 140 feet high, the latter having two large trees near the summit. Between Lambrino and Pistros are two patches of rocks above water, and another patch lies off the north-eastern point of Pistros.

There is a narrow channel leading to the northward inside Lambrino and Sophia islands, passing between Filipos and Lambrino islands, and westward of Pistros and the detached rocks, all of which show above water; all other channels between these islands are obstructed by shallow water.

**Carlónisi island**, of circular form, about half a mile in diameter, and 260 feet high, is situated about 3 cables eastward from Dragonera.

Day rock, eastward of Carlónisi, is mentioned with the northern approaches to Plateali, page 315.

**Provati island**, 200 feet high and one mile in length, is situated to the southward of Carlónisi, from which it is separated by a pass three-quarters of a cable in width with a depth of 9 fathoms.

**Chakolonisi**.—On the western side of Provati, distant about 2 cables, is the islet Chakolonisi, 60 feet high.

**The channel** between Dragonera and Pistros on the west, and Carlónisi, Provati, and Chakolonisi on the east, is clear. In using it Vromona island should be kept just open westward of Stamothi island, bearing S. 19° W.

**Pondiko island**, 215 feet high, is situated 4 cables to the south-eastward of Provati, and the channel between them is the most direct for vessels bound for Astoko in Dragamesti bay, from the southward. The north-west point is foul for  $1\frac{1}{2}$  cables from the shore, and when passing the locality Vromona island should be kept just open westward or touching Wreck rock. The south-eastern and eastern points of Pondiko are also foul, and in rounding the latter, Shag rock should be kept touching or open westward of the north-west point of Petala island.

**Pondiko shoal**.—A narrow ridge, with mud and weed bottom, having depths under 10 fathoms, extends from the bay north-eastward of Petala island to within half a mile of Day rock. Midway between Pondiko and Plaka bay on the mainland is a patch on this ridge of  $4\frac{1}{2}$  fathoms, and possibly less water (this being the position of Pondiko shoal of  $3\frac{1}{2}$  fathoms on former charts). Mount Velutzi in line with Glosa Pogonias, N. 2° W., leads westward of Pondiko shoal; Kunelli island on with Shag rock, S. 18° W., also leads westward of it.

**Shag rock**, 6 feet high, lies  $2\frac{1}{2}$  cables from the northern point of Petala island, with a deep channel between. A spit with less than 5 fathoms extends half a cable from its western side.

**Sentry bank**, least water found 10 fathoms, lies with Shag rock, distant  $3\frac{1}{4}$  cables, touching the north extreme of Petala island, and the western extreme of Petala island in line with the middle summit of Dioni, peninsula. It should be avoided by ships of heavy draught, as although the place was carefully examined, the sudden manner in which the head rises from the bottom points to the possibility of the existence of a pinnacle which the lead has failed to discover. When passing the locality, keep the summit of Dioni well open of Petala island which will lead westward of Sentry bank.

Chart.  
3,496 [814].  
Plan,  
1,939 [824].  
Var. 6° 0' W.  
Lat. 38° 26' N.  
Long. 21° 3' E.

The summit of Glosa Pogonias touching the east side of Pondiko leads midway between Sentry bank and Shag rock.

**Wreck rock**, 3 feet high and surrounded by foul ground about a cable in diameter, lies 7 cables S.  $\frac{1}{2}$  E. from the southern point of Provati island. It should not be approached within the distance of  $1\frac{1}{2}$  cables.

**Southern group.—Stamothi island.**—This group consists of four islands, forming a chain about  $1\frac{1}{4}$  miles in length north and south, separated from each other by narrow and generally deep channels. Cravaris, 80 feet high, shaped like a haystack, the northern and smallest, is situated  $1\frac{1}{10}$  miles from the southern end of Provati; Soros, 100 feet, and Apasa, 55 feet in height, lie to the southward. Stamothi, the southern and largest, is 229 feet high, triangular in form, and lies 3 miles north-eastward of Vromona, which island being nearly 500 feet high, serves as an object of general recognition when coming from the south-westward.

**A bank** of 11 fathoms lies half a mile S.E. of Stamothi island, one of 14 fathoms nearly  $1\frac{1}{2}$  miles S.S.E., and another of 13 fathoms about a mile S.W. of it.

Plan of Dragamesti bay,  
1,939 [824].

**DRAGAMESTI BAY** is  $3\frac{1}{2}$  miles in length by 2 miles in breadth at the entrance, narrowing within to less than a mile. The coast line on its north-western side is rugged, consisting as it does of the débris from the mountain slopes immediately behind.

The land rises almost precipitously immediately behind the town of Astokos, at the head of the bay, and the summit of mount Velutzi, 2,970 feet, is only  $1\frac{1}{2}$  miles from the wharf.

**Directions.**—Approaching Dragamesti from the north-westward, northward of the Dragonera islands, vessels of deep draught should observe the clearing marks for Venerable banks, page 312; cape Turkovkla bearing E.  $\frac{1}{4}$  S. leads northward of Prasa shoal, and between Grant and Davy banks. When the west extreme of Carlonisi touches the west extreme of Kaloyeros, the vessel will be eastward of those banks, and should shape course between the latter island and the cape, and thence to the anchorage.

From the southward, *see* page 317.

**Anchorage.**—A depth of 20 fathoms will be found at an average distance of a cable from the rocks until within half a mile of the head of the bay, when the water gradually shoals; good anchorage may be obtained off Astokos in a depth of 9 to 11 fathoms.

Lat. 38° 30' N.  
Long. 21° 5' E.

**Astokos**, a town of about 500 houses and 1,800 inhabitants, is situated at the north corner of Dragamesti bay. The town of Dragamesti is some distance up the valley.

**Communication.**—A road for wheeled vehicles extends towards Missolonghi through the hills on the south side of the bay. Steamers run between Patras and Astokos and to Corfu once a week, and mails either come up by them or overland on mules, *viâ* Missolonghi.

**Telegraph.**—There is a shore wire to Missolonghi.

**Supplies.**—Water of good quality is led down to the wharf at Astokos in pipes and a short stone pier gives shelter to small coasting craft. The supply of fresh meat and vegetables is not to be depended upon.

No. 1675.—STENIGONIA PENINSULA—LIGHT ESTABLISHED.

*Position.*—At a distance of about 130 yards north-eastward from former position and about 25 yards,  $339^{\circ}$  (*N.  $15^{\circ}$  W. Mag.*) from Stenigonia beacon (white).  
Lat.  $38^{\circ} 28'$  N., long.  $21^{\circ} 06\frac{1}{4}'$  E.

t

---

Details:

*Character.*—A flashing green light every two and three-tenths seconds, thus:—

Flash,	eclipse.
$\frac{3}{10}$ sec.	2 secs.

*Elevation.*—26 feet.

*Visibility.*—6 miles, from  $25^{\circ}$  (*N.  $31^{\circ}$  E. Mag.*), through east, to  $218^{\circ}$  (*S.  $44^{\circ}$  W. Mag.*).

*Power.*—Under 100 candles.

*Structure.*—Not stated.

*Remarks.*—The light is unwatched. A note "*posn. approx.*" is to be placed against this light on the charts.

*Variation.*— $6^{\circ}$  W.

Chart No. 3485.

Med. 3, pp. 315, 316, 317, 318.

t

XI.

ads

t a  
rati

sts  
nd  
ls.  
st,  
rd  
rd  
t-  
n

e  
a

i

**Trade.**—The exports from Astokos consist of wine, currants, corn, cattle, and the husk of the valonia oak, which is gathered in large quantities on the surrounding hills during the autumn.

Plan,  
1,939 [824].  
Chart,  
3,496 [814].  
Var. 6° 0' W.

**Pandelemona** is a narrow inlet, with depths of 15 to 25 fathoms, situated on the south-eastern shore of Dragamesti bay. It is 2 cables in width and nearly one mile in length, with two small branches near its head, but is too confined for large vessels, although there is plenty of water.

Plan on  
1,455 [818].

There are a few houses at the head of the northern inlet, which are inhabited during the season for picking the valonia husk, and the coasting steamers call to ship it.

The remains of Paleo Kastro, an ancient fortress, overlook the head of the inlet.

**Water** of indifferent quality may be procured from the wells at the back of the houses.

**PORT PLATEA, — northern approach. — Glosa Pogonias (Snipe point).**—On the south-eastern side of Dragamesti bay the coast is more indented, the hills behind slope less suddenly and are not so high. The 20-fathoms line of soundings is found very close to the rocks, and the only place from which shoal water extends is at Glosa Pogonias, in the northern approach to Platea.

Plan on  
1,455 [818].  
Lat. 38° 29' N.  
Long. 21 5 E.

**Shoal.**—This low, rocky, and irregularly shaped point, forms the southern extreme of Dragamesti bay and the western point of the peninsula of Pogonia, which separates the two little harbours of Pandelemona and Plateali; a shoal extends off it for a distance of 2 cables, with less than 3 fathoms water.

**Day rock,** having  $4\frac{1}{2}$  fathoms water, is situated  $1\frac{3}{10}$  miles N. 16° W. from the eastern extreme of Pondiko island and  $6\frac{1}{2}$  cables S. 48° W. from the extreme of Glosa Pogonias. The beacon on Vulcan point in line with the one on Carlo Glosa, S. 72° E., leads over the rock.

Plans,  
1,455 [818].  
1,939 [824].

**Clearing marks.**—The summit of Oxia island in line with the eastern extreme of Pondiko island, bearing S. 5° E., leads one cable westward of the shoal off Snipe point, and 2 cables eastward of Day rock. See view on plan, No. 1,939. Stenigonia beacon (white), situated on the south side of the entrance to port Plateali, kept in line with the beacon on the extreme of Carlo Glosa point (black and white horizontal stripes), bearing S. 48° E., leads south-westward of the shoal, and southward of Day rock.

The east extreme of Stamothi island in line with the east extreme of Provati leads about half a cable westward of Day rock. Stamothi, therefore, should not be visible when passing westward of Day rock. Vulcan point beacon, half a point open southward of Carlo Glosa beacon, bearing S. 77° E., leads a cable southward of Day rock.

**PORT PLATEALI (PLATEA).** — Separated from Pandelemona by the small hilly peninsula of Pogonia is the harbour of Plateali, between Carlo Glosa and the peninsula of Stenigonia.

Plan of port  
Plateali  
3,485 [882].  
Lat. 38° 28' N.  
Long. 21 6 E.

The entrance is  $2\frac{1}{2}$  cables broad, and the harbour is of semicircular form, extending  $8\frac{1}{4}$  cables north and south, and nearly 5 cables east and west.

Plans,  
3,485 [882],  
1,435 [818],  
1,939 [824],  
Var. 6° W.

Plateali being easy of access is largely used by H.M. ships for purposes of training, &c., during the winter months. With the permission of the Hellenic Government good paths round shores of the bay, sheds, and recreation grounds have been constructed, together with several houses, the property of the contractors who supply H.M. ships (occupied only during their stay), who lease or own the ground in the neighbourhood for purposes of grazing cattle.

Numerous beacons have been erected round the shores of the bay, which, on reference to the chart, it will be seen serve to point out the several berths intended to accommodate five large ships, together with smaller size vessels. Beacons (white) have also been erected at the head of the bay, which, when in line, bearing N. 50° E., lead in the fairway.

Chart,  
3,496 [814],  
Plans,  
1,939 [824],  
3,485 [882].

**Directions.** — Approaching Plateali from the north-westward, observe the directions for Dragamesti, page 314, until abreast cape Turkovlekla; thence, with Stenigonia white beacon in line with Carlo Glosa black and white beacon, S. 48° E., which leads between the shoal off Snipe point and Day rock. When Snipe point (Glosa Pogonias) bears North, course may be altered to pass Carlo Glosa at a prudent distance, and thence into port Plateali. The beacons at the head of the harbour in line, bearing N. 50° E., lead through the entrance and up to the anchorage.

This is the snuggest anchorage in the neighbourhood, and has depths of from 10 to 13 fathoms, good holding ground, thoroughly sheltered. There are no dangers outside the 3-fathoms contour-line.

**Calibrating range.** — **Beacons.** — On various points in and near port Plateali, stone beacons, from 7 to 10 feet high, have been erected for vessels calibrating, as shown on the plan. For fleet purposes only.

**Climate.** — Fevers are not uncommon, especially in the hot dry summer months, partly attributable to the exhalations arising from the proximity of the extensive marshy ground to the southward, and if a lengthened stay is contemplated it would be better to anchor outside the limits of this confined bay; inside the harbour the sea breeze, of short duration, may not be expected to reach till past mid-day.

Plan,  
1,939 [824],  
Chart,  
3,496 [814].

**COAST.** — Southward of Plateali the coastline is rocky and indented with several little bays for 1½ miles, when the coast hills suddenly cease and are succeeded by a flat marshy plain, which extends to the Kunevima range of hills.

**The Kunevima range** rise suddenly from the plain to heights of from 300 to 545 feet, with well-marked extremes, in the characteristic manner of all the hilly tracts in the delta of the Aspro Potamo. Such tracts are largely used for grazing cattle, which are shipped at the little bay Ovria, an inlet of port Petala.

\*Lat. 38° 22' N.  
Long. 21° 6' E.

**Petala island**, 2½ miles in length, is hilly and rocky, rising in the centre to 832 feet,\* and provides pasture for considerable flocks of sheep and goats; there are also a few small patches of cultivated ground. The western coast is irregular, steep, and rocky, but with deep water close to; the eastern side is also steep and about the centre precipitous and of imposing appearance, the cliffs being 60 feet high, with several caves. Shallow sandy flats, generally covered with a dark weed, separate Petala from the mainland, and are the site of numerous fisheries. Close to the island there is a boat channel with about 3 feet of water.

**Port Petala** is situated between Petala island and the Kunevima range; the entrance is between the southern end of Petala island and the northern end of Dioni peninsula, and is half a mile wide.

Plan,  
1,939 [824],  
Chart,  
3,496 [814].  
Lat. 38° 23' N.  
Long. 21 7 E.  
Var. 6 0 W.

The anchorage is good and well sheltered, but the depth of water is not sufficient for vessels drawing more than 16 feet to obtain the full advantage. Vessels of greater draught would have to anchor just inside the entrance, without shelter from the westward.

**Directions.**—To enter port Petala steer to pass the south end of Petala island at a distance of 2 cables, heading for Glosa Ovrias, the point on the eastern side of the harbour; when Oxia island is seen open eastward of Dioni peninsula, steer for the northern extreme of the Kunevima hills, until San Nicolo chapel on the neck of the promontory which forms the eastern point of Petala island comes in sight, when steer for the end of the promontory and anchor as convenient.

Port Petala is much frequented by vessels engaged in the timber trade. The logs are rafted alongside from the mouth of the Aspro Potamo (to the southward). The port being situated near the entrance to the gulf of Patras is the refuge for sailing trading vessels when meeting south-westerly gales near Cephalonia and Zante; also during the heavy south-easterly winds down the gulf of Patras in the winter season.

**Dioni peninsula** is similar in character and appearance to Petala island, but on a smaller scale. The western side has deep water close to the rocks. The peninsula is connected to the plain on the mainland by a neck of sand and mud.

Chart,  
3,496 [814].

**Directions.**—**Dragamesti bay from southward, westward of Pondiko.**—When within a mile of Stamothi island in the southern approach, shape course to pass a quarter of a mile eastward of Wreck rock, and when abreast it steer for the centre of the channel between Provati and Pondiko islands, with Wreck rock open of the eastern extreme of Vromona island until Oxia island disappears behind Pondiko, to avoid the foul ground extending north-westward from Pondiko. Thence by keeping within a quarter of a mile of Provati and of Carlonisi (when Stamothi will be shut in), the vessel will pass well to the westward of Day rock and the shoal off Glosa Pegonias, whence course may be shaped for the conspicuous white chapel on the point about a mile to the westward of Astoko. When the south point of entrance to port Pandlemona bears East, the vessel will be northward of Glosa Pegonias shoal, and may steer up Dragamesti bay for the anchorage off Astokos.

Chart,  
3,496 [814].  
Plan,  
1,939 [824].

**Channel eastward of Pondiko.**—When approaching the northern end of Petala, bring the summit of Glosa Pegonias (Snipe point) in line with the eastern side of Pondiko, bearing N. 7° E., which being steered for will lead midway between Shag rock and Sentry bank; or a vessel may pass between Shag rock and Petala. Thence bring Shag rock touching the north-west point of Petala, and keep them in line, S. 5° E., astern, until the south extreme of Stamothi island is in line with the south-east extreme of Pondiko island. Thence, by keeping within a quarter of a mile of Provati and Carlonisi, proceed as before directed for Dragamesti bay. To pass eastward of Day rock, when northward of Pondiko, bring the summit of Oxia in line with the east extreme of Pondiko, bearing S. 5° E., astern (*see* view on plan, No. 1,939), which

Lat. 38° 21' N.  
Long. 21 4 E.

Chart,  
3,496 [814].  
Plan,  
1,939 [824].  
Var. 6° W.

leads between Day rock and the shoal off Glosa Pogonias. When northward of Glosa Pogonias shoal steer for the anchorage as before directed.

If bound for Plateali the same directions will apply until the eastern extreme of Pondiko island is in line with the northern extreme of Vromona island; these kept in line, astern, will lead across Pondiko ridge in a depth of 10 fathoms, and straight into Plateali.

The beacons at the head of Plateali harbour in line, N. 50° E., lead through the entrance and up to the anchorage, as before stated.

Charts,  
3,496 [814].  
1,676 [826].  
Lat. 38° 21' N.  
Long. 21° 6' E.

**COAST.—Dioni bay.**—H.M.S. *Goldfinch* during the survey in this vicinity, when resorting to this anchorage on several occasions found a heavy breaking swell to quickly rise with westerly and north-westerly winds in a depth of 12 fathoms, Makri island affording but little shelter. These winds, of moderate strength, may be expected in the summer season to set in daily by mid-day, continuing till near midnight.

Lat. 38° 20' N.  
Long. 21° 6' E.

**Aspro-Potamo** or White river, ancient *Achelous*, runs into the sea after a tortuous course through the extensive plain between the peninsula on the southern side of entrance to port Petala and the base of mount Kutzulari. It averages 100 yards in breadth for 30 miles from its mouth, with from 1½ to 4 fathoms water, but with only about 2 feet on the bar. At its mouth is a low grassy island forming two narrow entrances with sandbanks nearly awash on either side, the northern entrance is that principally used; kayaks of moderate size may be constantly seen passing to and fro.

The Aspro-Potamo is the largest river in Greece, and, flowing from a high mountain range, in the winter becomes swollen and inundates the whole plain near the sea, bringing down a large quantity of deposit. These floods as well as the receding of its waters are sometimes very sudden. In December 1875, it was observed by H.M.S. *Devastation* that the river, which was very full on the 13th of the month, had fallen by the afternoon of the 17th, or in four days, upwards of 7 feet.

The sea breaks on the bar with south-westerly winds, the water being shallow half a mile from the entrance, but deepening very suddenly beyond that distance. At times the sea is discoloured nearly 2 miles from the shore, the line of discoloration being very markedly defined.

**Clearing mark.**—From the northward, if intending to pass inside Oxio island, the north extreme of Vromona island kept in sight southward of Makri island until the river entrance is passed leads 4 cables off the shoal water of the river bar.

**Oxia bay.**—H.M.S. *Leander* anchored in Oxia bay (1904) in a depth of 15 fathoms, with the extremes of Oxia island bearing S. 61° W. and S. 21° W., Scrophia islet being just shut in with the coast of the mainland between. The anchorage was found very useful for Destroyer work, it being easy of access by night. In blowing weather the squalls from the high land are extremely heavy.

**ECHINADES ISLANDS.**—**Vromona island**, situated S.S.W. ½ W. distant 3 miles from Stamothei islet, is nearly oval, one mile in extent north and south, flat-topped, rising to a height of 472 feet at its southern part.\* The island is partly cultivated, and inhabited only by shepherds.

\*Lat. 38° 22' N.  
Long. 21° 0' E.





**Makri island.**—The north-western end of Makri is  $1\frac{1}{2}$  miles eastward of Vromona; the island is 2 miles in length north-west and south-east, but narrow, its greatest breadth being about 3 cables. Makri hill, 417 feet high, and cone-shaped, forms a conspicuous object. About a cable eastward of its south-eastern end is Kunelli, a steep rocky islet 82 feet high and about 3 cables in length.

The water round these islands is deep; they are steep-to and may be approached to within a prudent distance. A narrow rocky ledge with irregular depths connects Kunelli and Makri islands, rendering the channel between them unsafe except for small craft fully under command.

**Oxia island**, situated on the north side of entrance to the gulf of Patras, is  $2\frac{1}{2}$  miles in length north-east and south-west, of an irregular form, being contracted in the middle to a mere isthmus with a bay on either side, one open to the north-west, the other to the south-east. The island is easily recognized by its precipitous rugged appearance, and when first seen appears as two, the northern portion being far the higher with a truncated peak 1,380 feet above the sea,† and nearly the same height as mount Kutzulari on the mainland, 2 miles north-eastward of it.

†Lat.  $38^{\circ} 18' N$ .  
Long  $21^{\circ} 7' E$ .

On the northern side of the island is a cove, receding about 3 cables, with a beach, and anchorage for small craft in a depth of 11 fathoms. Oxia is steep-to all round, and is separated from the mainland by a deep channel 6 cables wide affording shelter and anchorage in depths upwards of 25 fathoms; its south-western extreme is named cape Oxia; it is inhabited by shepherds only. The peak of Oxia, with mount Kutzulari, form excellent marks for the gulf of Patras; see view A on top of chart No. 1,676.

**LIGHT.**—**Cape Oxia.**—From a grey cylindrical tower with stone dwelling attached, 24 feet high, on the south-west extreme of Oxia island, a *flashing white* light is exhibited every *five seconds*, elevated 235 feet above the sea, and visible in clear weather from a distance of 22 miles, between the bearings of S.  $33^{\circ} E$ ., through east and north, to S.  $87^{\circ} W$ .

Lat.  $38^{\circ} 17' N$ .  
Long.  $21^{\circ} 6' E$ .

The landing is difficult at cape Oxia, except in calm weather.

**Scrophia point and shoal.**—See page 339.

**CEPHALONIA.**—**General remarks.**—Cephalonia, Chart, 203 [819]., ancient *Kephallinia*, the largest of the Ionian islands, is  $27\frac{1}{2}$  miles in length in a northerly and southerly direction from cape Scala or Monda at its south-eastern end to cape Vlioti on the north, with a varying breadth of  $2\frac{1}{2}$  to 19 miles, the bulk of the island lying westward of the line of its extreme length and being irregular in form and deeply indented with bays, of which two, port Argostoli and Samos bay, are excellent harbours.

It is very mountainous, a calcareous ridge traversing nearly the whole length of the island; the highest point, 5,218 feet above the sea, is near the south-eastern end, and was anciently called mount *Ænos*, now mount Nero or Black mountain. This mountain was formerly covered with a fine pine forest, portions of which still remain, but the greater part was either wilfully or carelessly set on fire and burnt about the commencement of the last century. In continuation of the mountainous ridge to the northward, the heights range from 2,174 to 3,212 feet high.

The principal productions are currants, oil, wine, and melons; the latter are celebrated for their size and flavour, frequently keeping good

Chart, 203 [819].  
Var. 6° 10' W.

for a long time. Provisions are not plentiful except those of the commonest sorts; only a few sheep and goats are reared on the island, owing to the scarcity of pasture, the cultivation of the vine being continued almost to the summits of the mountains. Cattle are brought from the mainland.

**Communication.—Telegraph cables.**—There is direct and frequent communication by steamers with the Black sea, Austria, Germany *viâ* Trieste, Italy, and Great Britain. Telegraphic communication is sent *viâ* Zante through Otranto, Malta, and Trieste. Telegrams to Russia or the Levant are sent *viâ* Zante and Chios. Roads throughout the island are good, having been made during the British occupation; they are still fairly maintained.

The telegraph cables connecting Cephalonia with the general system are, one from the eastern side of Samos bay to Ithaca, and another leaving the shore about  $1\frac{1}{2}$  miles westward of cape Monda or Scala and landed about half a mile north-westward of cape Krionero in Zante.

**Population.**—There are about 78 towns and villages in the island, and the population in 1896 amounted to 70,077.

**The Climate** in general is healthy, but intermittent fever is prevalent during summer in the low lands of one or two marshy districts, especially near Samos, on the eastern side of the island; the only precaution necessary in these parts is non-exposure to the early morning or night air, and the only specific in use is sulphate of quinine.

**Quarantine.**—There being no quarantine station in this island, vessels arriving from an infected port must proceed either to Corfu or to Trizonia near Patras. Those, however, that are only subject to five days' observation, can perform operations with the usual sanitary precaution.

Lat. 38° 29' N.  
Long. 20 34 E.

**Cape Vlioti, the northern point** of Cephalonia, lies southward 5 miles from cape Dukato, the south extreme of Santo Maura. The high land at the northern end of the island terminates in cape Vlioti, which is low, cliffy, and steep-to, with a rocky shore.

Lat. 39° 38' N.  
Long. 20 40 E.

**ITHACA CHANNEL. — Western shore.**—From cape Vlioti, the eastern coast of Cephalonia trends south-eastward, the northern entrance to the Ithaca channel commencing a mile northward of Guiscardo lighthouse, where the coast of Cephalonia approaches that of Ithaca, southward of Oxoi point, to  $1\frac{1}{2}$  miles; thence, the channel takes a S. by E. direction for 12 miles to its southern entrance between cape Dekalia on the Cephalonian shore, and St. Andrea point, Ithaca.

Agriossiko bluff, 9 miles southward of Guiscardo point, is the termination of a spur of the high mountain range immediately over it and is composed of conspicuous steep white cliffs; between this bluff and cape Dekalia the coast falls back, forming the deep bay of Samos. Nearly the whole distance to Agrissiko bluff is irregular, with several coves where boats receive and discharge cargoes of fruit and corn, but which have no other importance. The Ithaca shore is fairly straight.

The narrowest part of the channel is near the northern entrance, where it is only  $1\frac{1}{2}$  miles wide as above mentioned. At its southern entrance it is 2 miles broad; elsewhere it has a general width of  $1\frac{1}{2}$  to  $2\frac{1}{2}$  miles, with mid-channel depths of 80 to 90 fathoms, and both shores are steep-to, with the exception of here and there a rocky fringe quite close to the cliffs, and Deskalio islet described on the following page.

**Guiscardo bay** is a small bay in Ithaca channel, about 2 miles south-eastward of Cape Vlioto, the north-west point of the entrance. The bay is about 3 cables deep in a N.N.W. direction and a cable wide in the narrowest part, where a point projects from the western side abreast the custom-house, within which is a small inner harbour, with a depth of 8 fathoms, good holding ground, but limited space. The village, on the western side, consists of a church and about 35 houses, inhabited entirely by seafaring men, to whom the patches of cultivated land around belong. A few small vessels call here for currants during the season, about 700 tons being exported annually.

In westerly and north-westerly gales, vessels will find shelter in the bay in 11 to 14 fathoms, with the lighthouse bearing about N. by E.  $1\frac{1}{2}$  cables; here there is room for a large ship to moor.

**LIGHT.**—**Guiscardo point.**—At 142 yards within the northern point of entrance to Guiscardo bay stands a square masonry tower, 48 feet high, from which at an elevation of 90 feet above the sea a *fixed white* light is exhibited, visible in clear weather from a distance of 9 miles. The light shows through the Ithaca channel to the southward, and becomes visible from the northward when bearing southward of S.  $18^{\circ}$  E. The lighthouse is conspicuous by day when approaching from Ithaca channel and marks the entrance to the bay.

Chart, 203 [819].  
Var.  $6^{\circ}$   $10'$  W.  
Lat.  $38^{\circ} 27'$  N.  
Long.  $20^{\circ} 36'$  E.

**Deskalis islet**, about 3 cables from the coast of Cephalonia, and  $1\frac{1}{2}$  miles southward of Guiscardo lighthouse, is about a cable in length, flat, 10 feet high, and of a reddish colour, with the ruins of an old tower on it. Shallow water extends a little northward and southward of the islet. To avoid the islet at night, keep Guiscardo light a little westward of N.N.W.  $\frac{1}{2}$  W. until certain of being past it.

**Directions.**—Vessels from the north-westward bound through the Ithaca channel will first sight the high land of Santa Maura and then the remarkable white patch 2 miles northward of cape Dukato, Sappho's leap; next, the high, bold headland of Oxoi point, Ithaca; and, finally, the northern point of Cephalonia which is comparatively low.

Vessels under sail should not enter Ithaca channel except with a fair wind, as the water is too deep for anchoring should it fall calm, the currents are uncertain and, at times, terrific squalls blow from the neighbouring high lands.

**Port St. Euphemia or Pilaros cove.**—This cove,  $1\frac{1}{4}$  miles south-westward of Agriossiko bluff, falls in a quarter of a mile and is  $1\frac{1}{2}$  cables wide; it affords anchorage for coasting vessels in a depth of 2 to 8 fathoms, the water shoaling gradually to its head. There is a quay and mole, on the head of which is a lighthouse.

It is rarely visited in winter, being exposed to winds from N.E. to S.E., which send in a heavy swell. Violent squalls also blow down the deep valley extending westward from the cove.

The village is small, comprising only about 45 houses; the principal feature is the church, said to be the finest in the seven islands. During the summer months, local traders transmit goods across the island to Argostoli from this place in preference to the more mountainous road from Samos,  $3\frac{1}{2}$  miles south-eastward of St. Euphemia.

**Light.**—From a small square tower at the mole-head in Pilaros cove, is exhibited, at an elevation of 24 feet above the sea, a *fixed white* light, visible in clear weather from a distance of 6 miles.

Lat.  $38^{\circ} 18'$  N.  
Long.  $20^{\circ} 7'$  E.

Chart 203 [819].  
 Lat. 38° 16' N.  
 Long. 20 39 E.  
 Var. 6 10 W.

**SAMOS BAY**, in Ithaca channel, between cape Dekalia on the east and the opposite shore on the west, is  $2\frac{1}{2}$  miles wide and  $1\frac{1}{2}$  miles deep. It is semicircular, sheltered from all winds but those from the northward, and even from that quarter no dangerous sea can rise in so land-locked a position ; at the head, the bottom is mud and sand, and is good holding ground.

Vessels may anchor in depths of 12 to 15 fathoms ; a good berth for a small vessel is with the largest house in the village of Samos bearing about S.E., distant half a mile, and the extreme of cape Dekalia N.E.  $\frac{3}{4}$  E. ; large vessels should anchor farther out. A small mole projects in a westerly direction into 2 fathoms water from near a large house, and is used by small craft. During strong winds, it is necessary to be prepared for the heavy squalls which blow from the high land.

The village is in the south-eastern angle of the bay, and is small and straggling. On the summit of a hill eastward of it are the ruins of the ancient city of Samos. An extensive plain, richly cultivated and well watered, extends southward from the head of the bay.

The telegraph cable connecting Cephalonia with Ithaca is landed in the eastern part of this bay.

**Light**.—A *fixed green* light, elevated 23 feet above the sea, visible at the distance of 4 miles, is exhibited from a support over an iron shed on the pier head at Samos.

**Cape Dekalia**, the eastern point of Samos bay, is a bold, bare, rocky headland, easily recognised by a small and remarkable peak over it about 525 feet high and partly covered with bushes. The cape also, as before described, forms with St. Andrea point the southern entrance of Ithaca channel.

On the eastern side of the cape is Andi-Samos bay, about three-quarters of a mile deep, but of no importance. A vessel might anchor in this bay in a depth of 10 or 12 fathoms, about 2 cables from the beach at its head, but as it is open to the north-east, from which quarter heavy squalls at times prevail, it can only be used as a stopping place during summer.

**ITHACA CHANNEL, East shore**.—**Oxoi point** is the eastern point at the northern entrance of Ithaca channel, it is high and bold, and from a distance westward is seen before the land of cape Vlioti of Cephalonia, which is much lower. When seen from the westward, it appears as a large round headland with an old tower on its summit. The water in its vicinity is deep and the current perceptible.

**Port Polis**.—At  $2\frac{3}{4}$  miles southward of Oxoi point is the port of Polis ; it is circular, 3 cables in diameter, with its entrance a cable wide, open south-westward, and directly east of Deskalio islet ; there is a depth of 17 fathoms in the middle of the port, but small vessels anchor near the shore. The hill overlooking it on the north is 870 feet high. The ruins in the vicinity of Frikes are easily visited from this anchorage.

**Opis Aito** is a small bay with a sandy beach on the eastern shore of Ithaca channel,  $3\frac{1}{2}$  miles southward of port Polis, communicating with port Vathi by a road across the isthmus of Ulysses passing eastward of mount Aitos, the hill on which are the ruins of the castle. The telegraph cable to Samos bay leaves the shore in this vicinity.

**St. Andrea point and port**.—At  $3\frac{1}{2}$  miles southward of Opis Aito is St. Andrea point, the south extreme of Ithaca and the western point of entrance to the little port of St. Andrea, which is a cable wide and 4 cables deep, terminating northward at its head in a sandy

Lat. 38° 29' N.  
 Long. 20 38 E.

Lat. 38° 26' N.  
 Long. 20 39 E.

Lat. 38° 18' N.  
 Long. 20 44 E.

beach where small coasters find anchorage; there is a depth of 30 fathoms at the entrance, diminishing to 8 and 3 fathoms near the head. In the vicinity, on the side of a cliffy hill, is the celebrated fountain of Arethusa.

Chart, 203 [819]  
Var. 6° 10' W.

Between St. Andrea point and cape Dekalia of Cephalonia, is the southern entrance of Ithaca channel, nearly 2 miles wide, with bold shores on either side and deep water, as described at page 320.

**EAST COAST of Cephalonia** (*continued*).—Agrilios point, 1½ miles south-eastward of cape Dekalia, is steep and rocky, with a round knob on it; Grosso point, 1½ miles farther southward, is a steep and remarkable perpendicular rocky cliff rising abruptly from the sea from 100 to 130 feet high; the coast from thence to Pronos bay, a distance of 5 miles, is nearly straight.

Lat. 38° 9' N.  
Long. 20 47 E.

Pronos bay is nearly 1½ miles wide and recedes about a quarter of a mile; the shore is mostly shingle. Small country vessels anchor occasionally in the southern extreme of the bay where there is a little mole, but with an easterly wind a heavy sea rolls in.

In the southern part of Pronos bay is a remarkable gorge from 300 to 400 feet high, the outlet for the mountain torrents which empty themselves into the bay during the winter season. The shore for more than a mile south-eastward of Pronos bay is rocky; from thence it becomes steep and clear to cape Kapri a little farther on. Cape Kapri, the eastern extreme of Cephalonia, is bold and steep-to; a sharp-topped hill, 543 feet high and partially covered with stunted trees, rises immediately over it.

Charts,  
203 [819].  
1,676 [826].

**SOUTH COAST.—CAPE MONDA (Scala)**, 3½ miles S.S.W. ¼ W. from cape Kapri the south extreme of Cephalonia, is a bold and remarkable bluff 100 feet high, its face being a steep clay cliff; the land for a mile northward of the bluff is low and cultivated.

Lat. 38° 4' N.  
Long. 20 48 E.

**Kakova shoal**.—The south-eastern coast of Cephalonia, from 1½ miles northward of cape Monda, is bordered by a shallow ridge which surrounds the cape and shore to the westward, and projects 1½ miles in a south-easterly direction, terminating in a depth of 4 to 5 fathoms dropping suddenly to 13 and 24 fathoms, the bottom being rocky and irregular.

Charts,  
1,676 [826],  
203 [819].  
Lat. 38° 2' N.  
Long. 20 50 E.

There is a patch of 3 fathoms on its western ridge at one mile from the cape.

**Clearing marks**.—The west extreme of Atoko island just touching cape Kapri, bearing N. ¼ E., leads over the east point of Kakova shoal; the island should therefore be kept well open of the cape. St. Giorgios castle in line with or just open southward of Koroni bluff, N.W. ¾ W., leads nearly a mile southward of it.

**Coast**.—Between cape Monda and cape Cataleo, nearly 2 miles farther westward, the coast forms a bay with a sandy shore bordered by rocks and shallow water. The telegraph cable connecting Cephalonia with Zante leaves the shore in this bay about 1½ miles westward of cape Monda. Small craft anchor off the little village of Cataleo in the north-western corner. A heavy westerly swell frequently sets into the bay and sailing vessels should not stand too close in.

Chart, 203 [819]

From cape Cataleo to Koroni bluff 2½ miles farther westward, the coast cliffs are from 250 to 300 feet high, bold and precipitous, showing remarkably white from seaward, and skirted by sunken rocks.

**Loortha bay**.—Between Koroni bluff and cape Liakas, which are 6 miles apart, is Loortha bay, 2 miles deep; the coast at first consists of steep cliffy points followed by a sandy beach 1½ miles in extent; from thence the general features are white clay cliffs from 50 to 100 feet high for

Chart, 203 [819].  
Var. 6° 10' W.

2½ miles to cape Liakas, which is a low shelving sandstone point rising gradually to the cultivated land within it; the cape is surrounded for a distance of about a cable by detached sunken rocks. With all winds southward of East and West, a heavy swell sets into the bay, accompanied by surf on the beach. With northerly and easterly winds, very heavy squalls blow down from mount Nero, which rises immediately over it.

Lat. 38° 5' N.  
Long. 20 35 E.

**Danisti rock**, lying half a mile S.S.W. ½ W. from cape Liakas, has a bare white appearance, and is 8 or 10 feet in height; the sea at times breaks heavily upon it. There is a depth of 7 fathoms between the rock and the cape, but vessels should not use this passage.

Lat. 38° 5' N.  
Long. 20 33 E.

**Thio-nisi**.—Between capes Liakas and Pelagia, 2 miles farther westward, the shore is low and forms a bay encumbered with rocky patches, with depths of from one to 2 fathoms, and deep water between them. Half a mile from the shore and one mile westward of Danisti rock, is the rocky islet Thio-nisi, about a cable in diameter, 80 feet high, and with a monastery on its summit. Thio-nisi bearing northward of East clears the tail of the reef extending from cape Pelagia.

The coast from cape Pelagia to St. Nikolaos islet, is low and fringed with rocks.

Plan of Argostoli, 1,557 [825],  
with views.  
Lat. 38° 10' N.  
Long. 20 28 E.

**PORT ARGOSTOLI**.—**Depths**.—From the depth of 20 fathoms at the entrance, the water gradually shoals to 4 fathoms about a mile from the head of Livadi bay, some 9 miles from the entrance. Argostoli harbour on the eastern side has general depths of 9 to 12 fathoms, and is available for all classes of vessels.

**Aspect**.—The entrance to port Argostoli is between St. Nikolaos islet on the east, and Vardiani island on the west, which are 2½ miles apart. About 2 miles farther in are the two points of Lardigo and St. Georgios, the former on the east, the latter on the west; from thence, a deep inlet averaging 1½ miles wide, extends 7½ miles northward, the upper part being known as Livadi bay.

At 2½ miles within St. Georgios point, on the western shore, is the town and port of Lixuri, with a small harbour enclosed by two breakwaters; immediately opposite on the eastern shore is the deep inlet to the southward forming the harbour of Argostoli, the town of which stands on its western shore.

The land on the eastern side of the port is much higher and steeper than that on the western side, and forms a ridge extending from mount Kotroni, 791 feet high, at 1½ miles north-east of St. Nikolaos point, to San Theodoro point, 4 miles to the northward, gradually decreasing in height.

The land on the western side is comparatively low and much more broken until it reaches the central ridges of that part of the island 3 miles distant, the summit of which is 1,478 feet high.

Lat. 38° 7' N.  
Long. 20 30 E.

**St. Nikolaos point and islet**.—St. Nikolaos point on the eastern side of entrance to Argostoli, is low and shelving, the ruins of a small watch tower stand a quarter of a mile south-east of the point. A little over a cable north-west of the extremity of St. Nikolaos point lies the rocky islet of the same name, irregular in shape, 12 feet high, and about 200 yards in length.

Foul ground surrounds the point and islet, extending 2 cables in a westerly and northerly direction.

**A rock** covered with 3 feet water, on which the sea breaks except in fine weather, lies W. by S. ¼ S., distant 1½ cables from St. Nikolaos islet.

The village of Mignies is a little over three-quarters of a mile north-eastward of the point, with olive groves southward of it, and among the trees is the large and very conspicuous monastery of Mignies, with a white tower, a useful seamark.

Plan of Argostoli, 1.557 [825], with views, Var. 6° 10' W.

Between St. Nikolaos islet and Lardigo point the land recedes and forms a bay, everywhere skirted by rocks extending some distance off-shore; in the middle of the bay are conspicuous white cliffs 240 feet high. Sailing craft should avoid standing too far into the bay, especially near its extreme.

**Clearing mark.**—The two houses on San Theodoro point close east of the lighthouse bearing N.  $\frac{1}{4}$  E., and well open of Lardigo point, leads westward of the dangers off St. Nikolaos islet.

**St. Nikolaos banks,** on the east side of the entrance to port Argostoli, consist of two rocky banks lying in a north and south direction and occupying a space of  $1\frac{3}{10}$  miles. The southern bank with 6 fathoms least water is 5 cables long north and south, and half a cable across within the 10-fathoms line. The northern bank with 7 fathoms least water is 6 cables long, and one cable across; the bottom between these banks is uneven with depths of 9 to 10 fathoms.

Lat. 33° 8' N.  
Long. 20 29 E.

From the depth of 6 fathoms on the southern bank the highest part of St. Nikolaos islet bears E.  $\frac{1}{4}$  S. distant  $7\frac{1}{2}$  cables, and the extremity of Lardigo point N. by E.  $\frac{1}{4}$  E.

From the depth of 7 fathoms on the northern bank the highest part of St. Nikolaos islet bears S.E. by S. distant 9 cables, and the extremity of Lardigo point N.  $\frac{3}{4}$  E.

**Clearing marks.**—A ruined mill on a spur (896 feet high) on the east side of Livadi bay, near the village of Kuruklata in line with San Theodoro point lighthouse, bearing N.  $\frac{1}{2}$  E., leads westward of the St. Nikolaos banks.

**Vardiani island,** on the west side of the entrance to port Argostoli, is  $6\frac{1}{2}$  cables in extent north-west and south-east, and little over a quarter of a mile across the southern and broadest part, which is low and flat; the northern part is a long narrow cliffy projection 67 feet high; in the centre are the low white buildings of a monastery and on the south-eastern end and lowest part of the island stands a conspicuous lighthouse. The island is surrounded by rocks and shallow water which extend southward from it 3 cables, and, westward, nearly half a mile.

Lat. 33° 8' N.  
Long. 20 26 E.

The north-western end of the island is but little more than a mile from the shore and about equidistant from St. Georgios point and cape Akroteri, which are nearly 3 miles apart, the western part of the coast between them, exclusive of the Akroteri shoals, being bordered by scattered reefs and rocky patches extending nearly half a mile off shore.

**LIGHT.**—From the circular white lighthouse with square base on Vardiani island, 82 feet high, is exhibited at an elevation of 95 feet above the sea, a *fixed* light, showing *red* when bearing between S. 61° E. and S. 83° E., over Akroteri shoals; *white* from S. 83° E., through north, to S. 43° W.; *red* from S. 43° W. to S. 31° W., over the shallow part of Kalafati reefs; obscured elsewhere. The *white* light is visible in clear weather from a distance of 14 miles, *red* light at 6 miles. See view on plan, No. 1,557.

Plan of Argos-  
toli, 1.557 [825].  
Lat. 38° 9' N.  
Long. 20 21 E.  
Var. 6° 10' W.

**Cape Akroteri and shoals.**—Cape Akroteri is low and the southern termination of the land, forming the western portion of Cephalonia; the point is surrounded by rocks and shallow water, in continuation of the rocky patches from the eastward, which project over one mile southward.

Akroteri shoals are the outer rocky patches with  $3\frac{1}{2}$  and 4 fathoms water, on which the sea breaks occasionally. There are depths of 7 fathoms between these shoals.

**Clearing marks.**—Cape Gherogambo, situated about  $2\frac{1}{2}$  miles north-west of cape Akroteri, bearing northward of N.W. by N., leads westward of Akroteri shoals. The white tower of Mignies monastery in line with a small isolated white house on the crest of the first line of hills near Mignies, bearing S. 86° E., leads southward of the shoals and of all dangers southward of Vardiani island.

**The Coast** from cape Akroteri trends in an easterly direction for about 3 miles to St. Georgios point. Between cape Akroteri and Kse point, one mile east of it, the shore recedes and forms Akroteri bay, which is shallow and encumbered with rocks; the bottom between this and Vardiani island is uneven and rocky, with several patches of  $3\frac{1}{2}$  and 5 fathoms, the general depths being 7 to 9 fathoms.

**Vardiani shoal**, with 3 fathoms least water, lies  $7\frac{1}{2}$  cables north-east of Vardiani island, and is about half a mile in extent, with depths of 5 to 7 fathoms close around. From the shoalest part Vardiani lighthouse bears S.  $\frac{5}{8}$  W. distant  $10\frac{1}{2}$  cables, and Akroteri tower, in ruins, W. by N.  $\frac{1}{4}$  N.

**St. Georgios point**, north-north-eastward distant  $1\frac{1}{2}$  miles from Vardiani lighthouse, is surrounded by rocks and shallow water, the depth at 3 cables eastward of the point being 5 fathoms.

Kalafati reefs, on which the sea breaks, extend 8 cables S.  $\frac{3}{4}$  E. from the point, with depths of from one to 3 fathoms for the distance of 5 cables. From a depth of 5 fathoms at the extremity of the reefs Vardiani lighthouse bears S.W.  $\frac{1}{4}$  W., distant  $1\frac{2}{10}$  miles. The bottom eastward of the reefs is broken and rocky.

**Buoy.**—At  $1\frac{1}{2}$  cables within the 5-fathoms limit of the reefs, and at  $6\frac{1}{2}$  cables S.  $\frac{1}{2}$  E. from St. Georgios point, is moored a red buoy.

Westward of Kalafati reefs, and half a mile from the shore, there is temporary fine weather anchorage in a depth of 6 to 7 fathoms, sand, with the lighthouse bearing S.S.W.

**Caution.**—As the buoys marking the shoals often break adrift or are out of position, mariners are cautioned to be on their guard when navigating near these shores.

**Lardigo point**,  $2\frac{1}{2}$  miles north of St. Nikolaos point, on the eastern side of entrance, is 143 feet high; from it to San Theodoro lighthouse, 2 miles further north, the shore forms a slight bay skirted by rocks and shallow water; about midway are patches of 2 and  $2\frac{1}{2}$  fathoms which, off the watch-tower under the signal station, extend 4 cables from the shore. The shore itself is backed by a ridge 312 feet high, on which is the signal station communicating with the town of Argostoli on the eastern side of it.

**Clearing marks.**—The ruins of a mill on the spur of a hill, 896 feet high, on the east side of Livathi bay, near the village of Kuruklata, kept well open of San Theodoro lighthouse and bearing eastward of N. by E., leads westward of the shoal patches southward of the lighthouse.

**San Theodoro point** has near its extreme a lighthouse resembling a white temple 20 feet high surrounded by columns and a portico, with a dome and turret in the centre for the lantern. The point is low, rocky, and surrounded by rocks and shallow water extending a cable westward of the point,  $1\frac{1}{2}$  cables north-westward of it, and as much as 2 cables at some parts eastward of the point.

Plan of Argostoli, 1,557 [825].  
Var.  $6^{\circ} 10' W.$

**Buoy.**—A red buoy is moored on the edge of the shoal extending north-westward from San Theodoro point, with the lighthouse bearing S.  $\frac{1}{2}$  E., distant  $1\frac{1}{4}$  cables.

**Sandbank.**—A detached sandbank  $1\frac{1}{2}$  cables in extent north-east and south-west with depths of from 4 to 5 fathoms, lies with its south-west extremity bearing West, distant  $2\frac{1}{4}$  cables from San Theodoro point.

**LIGHT.**—**Port Argostoli.**—From the lighthouse on San Theodoro point, at an elevation of 37 feet above the sea, is exhibited a *fixed white* light, visible in clear weather from a distance of 5 miles between the bearings of N.  $1^{\circ} W.$ , through east and south, to S.  $40^{\circ} W.$  This latter limit is not reliable as the light has been seen when bearing further west. See view on plan, No. 1,557.

**Directions.**—In rounding San Theodoro point, give it a berth of at least 3 cables, and, as shallow water extends off the north eastern face of the point and along the shore to Argostoli, vessels bound for that port should steer well over towards the high land on the eastern shore before hauling in for the anchorage. The monastery of Vardiani island over the extreme of St. Georgios point bearing S.W.  $\frac{7}{8}$  S. leads westward of the shoal water round San Theodoro point.

**LIXURI.**—From St. Georgios point, on the western side of entrance, to Lixuri mole  $2\frac{1}{4}$  miles to the northward, the shore is low and bordered by rocks and uneven ground. The eastern side of St. Georgios point should not be approached nearer than 4 cables, and vessels of deep draught should give it a still wider berth by not going into less than 10 fathoms water, nor is there any occasion to stand nearer the shore than this depth when northward of the point.

Lat.  $38^{\circ} 12' N.$   
Long.  $20^{\circ} 27' E.$

**The town** of Lixuri on the low shore on the western side of the approach to Argostoli, is the seat of a Roman Catholic bishop, and contains about 6,000 inhabitants; its trade is greater than that of Argostoli and its position more healthy. It suffered much from an earthquake in 1866, which completely destroyed the place.

**Boat harbour.**—Near the southern end of the town a mole projects about 300 yards from the beach in an easterly direction, and then northward for another 240 yards; at 2 cables further north another mole extends 270 yards to the eastward. These moles form an anchorage for boats and small trading vessels.

Large merchant vessels anchor about 3 cables north-eastward of the entrance, in a depth of about 7 fathoms, mud, or farther out, as convenient.

**Light.**—From a stone column at the north end of South mole a small *fixed red* light is exhibited at an elevation of 19 feet above the sea, visible from a distance of 2 miles.

**Telegraph cables.**—A submarine cable connects Argostoli with Lixuri.

**LIVADI BAY** extends in a northerly direction for a distance of about 5 miles from San Theodoro point and Lixuri, with an average width of  $1\frac{1}{2}$  miles; there are depths of 14 to 15 fathoms at the entrance, shoaling

Plan of Argostoli, 1.557 [825].  
Var. 6° 10' W.

gradually to 5 fathoms within Quimilya point, and to 4 fathoms at a mile from its head. The eastern shore is bold and steep with deep water close to ; the western is low and sandy with a depth averaging 5 fathoms at from 3 to 4 cables from the beach.

**ARGOSTOLI.**—The harbour of Argostoli lies between the shore of San Theodoro point and that of the high land to the eastward ; it extends southward upwards of  $1\frac{1}{2}$  miles, terminating in the shallow lake of Kutavos at its head, which lake at its entrance is crossed by the bridge and causeway, 700 yards in length, of the road to Samos.

The harbour is about 6 cables wide at the entrance and narrows toward the head. As the western shore is bordered by shallow water, large vessels should keep midway or nearer the high land on the eastern side where the water is deep. The projecting points of the eastern shore of Livadi bay on with Kokkinos Vrachos N. by W.  $\frac{1}{4}$  W., astern, leads up Argostoli bay in depths of 11 to 10 fathoms until the signal station on the hill, bearing S.W.  $\frac{1}{4}$  S., is in line with the English chapel, a long low building with a clock in front ; a large vessel should not go south of this.

Nearly the whole of the inner part of the harbour from abreast the northern end of the town is shallow and fit only for small vessels.

**The town** of Argostoli, the capital of Cephalonia, is on the western shore at the head of the harbour, and is at times unhealthy, owing to the miasma arising from Kutavos lake, in its close vicinity ; it consists of about 2,700 houses, the principal being a small theatre, and a large communal hospital and poor house, to which British subjects are admitted on equal terms with the native population. The inhabitants numbered 10,086 in 1896.

**Trade.**—In the year 1907, 106 vessels of 98,921 aggregate tonnage entered the port, including the mail steamers of the Austrian Lloyds line. The chief exports are currants, wine, and oil, in this year amounting in value to 160,783*l.*, the total exports being 181,208*l.* The chief imports are cereals, manufactures (textiles), coffee, sugar, sulphur, petroleum, black cattle, timber, iron, and hardware, leather, and tobacco, the total value being 257,389*l.*

**Consulate.**—A British Vice-Consul resides at Argostoli.

**Coal and supplies.**—Coal is imported chiefly for the use of mills, about 1,400 tons annually, there being no regular demand for it otherwise. There is none available for vessels.

Good water can be obtained and is supplied in open boats of about 12 tons capacity. Provisions are good and plentiful, but about 10 days' notice is desirable when large quantities are required.

There are no facilities for repairs to either hull or machinery.

**The Anchorage** is off the Hospital in a depth of 10 or 11 fathoms, mud, good holding ground ; or, in a moderate sized vessel, further in and nearer the eastern shore. The Greek church, with spire painted blue and white, and the windmills near the Protestant Cemetery on the south-eastern shore are conspicuous, and form good marks for anchoring on. With strong winds from the southward, vessels anchor under the lee of San Theodoro point, north-westward of the buoy marking the shoal extending off it, in about 12 fathoms.

There is at times a slight rise and fall of water and a current sets in and out, but irregularly.

**DIRECTIONS.**—Approaching Argostoli from the southward and westward, the summit of mount Nero or the Black mountain, 10 miles eastward of the entrance to the port, may be seen in clear weather from a

Lat. 38° 11' N.  
Long. 20 30 E.

Lat. 38° 12' N.  
Long. 20 30 E.

great distance. On nearing the port, St. Giorgio's castle, on a hill 1,050 feet above the sea, Thio-nisi islet, with the monastery on its summit, and the white cliffs of the coast, all eastward of the entrance, should be sighted; on the western side is the lighthouse of Vardiani island, and the land is lower.

Plan of Argostoli, 1,557 [825].  
Chart, 203 [819].  
Var. 6° 10' W.

In approaching from the westward, the white cliffs in the immediate vicinity of St. Nikolaos island are conspicuous and appear as three; they make an excellent mark, and the southern cliff, which appears wedge-shaped, steered for on an E.N.E. bearing clears all dangers until the port is open, when a course may be steered up the bay. In entering the port between St. Nikolaos islet and Vardiani island, all dangers are avoided by keeping in mid-channel; or, if under sail with a foul wind, the clearing marks for the dangers on each side already given must be attended to.

From the southward or eastward through the channel by Zante, a vessel should avoid the Kakova shoal, and passing Thio-nisi and the coast westward of it at a prudent distance, enter in mid-channel as before.

Bound into Argostoli from the northward, after passing the south-western extreme of Cephalonia at a convenient distance, keep cape Gheroghambo northward of N.W. by N. until the belfry tower of Mignies monastery, in the olive grove on the eastern coast, bears S. 86° E., and is in line with a small isolated white house on the crest of the first line of hills near Mignies, when steer for it until Vardiani lighthouse bears N.N.W. distant about two-thirds of a mile; then steer N.E. for Lardigo point and proceed in mid-channel.

**At Night.**—Vessels from the north-westward should keep cape Gheroghambo light bearing northward of N.N.W.  $\frac{1}{2}$  W., and not approach within 2 miles of Vardiani light until it bears E.  $\frac{1}{2}$  N.; then steer about E. by S. and do not shoal into less than 13 fathoms water in passing the light; when it bears N.N.W. about three-quarters of a mile, steer N.E. about 2 miles, and then northward midway between San Theodoro and Lixuri lights. When past Vardiani light, it should be kept westward of S.W. by W.  $\frac{1}{2}$  W. until San Theodoro light bears northward of N.N.E. to avoid Kalafati shoals.

From the south-westward, the light should not be brought westward of N.W. until within  $1\frac{1}{2}$  miles of it; with this bearing and distance, steer about N. by E.  $\frac{1}{2}$  E. for San Theodoro light, and proceed as before.

From the south-eastward, Vardiani light should be approached to about  $1\frac{1}{2}$  miles, when San Theodoro light will bear N. by E.  $\frac{1}{2}$  E., and may be steered for until the Kalafati shoals are passed, thence proceed as before.

**COAST.—Cape Gheroghambo.**—From cape Akroteri, west side of entrance to Argostoli port, the low shore trends northward about a mile, when it becomes interspersed with cliff for  $1\frac{1}{2}$  miles farther to cape Gheroghambo; the shore throughout is irregular and bordered by rocks and shallow water. On the eastern side of the cape is a small rocky bay, and about three-quarters of a mile from it is Skisa point with its watch tower.

Chart, 203 [819].  
Lat. 38° 11' N.  
Long. 20 21 E.

Cape Gheroghambo is rocky, and a reef projects a cable southward from it; other rocks lie about the same distance from the shore north-westward of the cape. Mount St. Sidaro rises 6 cables northward of the cape.

**LIGHT.**—From a square masonry tower, with dwelling attached, 51 feet high, on cape Gheroghambo, a *group-flashing* light is exhibited at an elevation of 164 feet above the sea, showing *two white* flashes alternately with *two red* flashes, thus:—*Two white* flashes in quick succession, *two seconds*; eclipse, *three seconds*; *two red* flashes in quick succession, *two seconds*; eclipse, *three seconds*. The *white* flashes are visible in clear weather from a distance of 19 miles, *red* at 15 miles.

Chart. 203. [819].  
Var. 6° 10' W.

**Coast.**—At cape Gheroghambo is the commencement of high land which trends north-north-eastward 5 miles to cape Ortholithia, when it turns eastward for about a mile, forming the bay of this latter name, with a sandy beach at its head, and open to the north-west. In this bay there is temporary anchorage for small vessels with off-shore winds. The coast from thence continues northward nearly 6 miles farther to cape Aterra ; it is everywhere composed of bold weather-worn cliffs broken by small sandy bays, with here and there scattered rocks near the shore.

Kabbo point,  $1\frac{1}{2}$  miles northward of cape Gheroghambo, is a peculiar tongue of land projecting westward, and over the high cliffs on its northern side is a monastery. At cape Ortholithia, and between it and a short mile southward of it, are several rocks above and below water, but close to the coast.

**Cape Aterra**, the north-western point of Cephalonia, is a bold prominent headland with steep white broken cliffs on its western side, and for  $1\frac{1}{2}$  miles southward of it are several sunken rocks, some of them nearly 2 cables from the shore. The water along this part of the coast is very deep at a short distance off, the 100-fathoms line of soundings being nowhere a mile distant from the shore, and at capes Aterra and Ortholithia scarcely a cable.

Lat. 38° 21' N.  
Long. 20 26 E.

**Port Aterra**, between the cape of this name and cape Kakata, nearly 2 miles to the eastward, is an inlet  $1\frac{1}{4}$  miles deep, with steep rocky shores on either side, and a small sandy beach at its head. An islet lies in the middle of the port, and small coasting vessels find shelter close under its lee, but as the water is deep and the inlet open to the northward, without village or inhabitants, it is seldom resorted to.

**Gulf of Myrto.**—At 4 miles eastward of cape Kakata is fort Asso, the coast between falling back 3 miles to the southward and forming the gulf of Myrto, between steep and precipitous shores with sandy bays at intervals. There is no anchorage, and caution should be observed in a vessel under sail not to get embayed ; the wind frequently falls to a calm under the high land, and a heavy swell rolls in from the north-west.

Lat. 38° 23' N.  
Long. 20 33 E.

**Port Asso** is a small inlet between a high double-peaked promontory crowned by the ruins of fort Asso, formerly an extensive Venetian fortress, and the mainland, with which it is connected by a narrow sandy isthmus. The port is open to the northward, is 2 cables wide and 3 cables deep, and affords accommodation during the summer months to the small coasters which call here for the produce of this well-cultivated district ; during winter it is seldom visited, being exposed to northerly winds, which send in a very heavy sea.

Outside the port, there is temporary anchorage in depths of from 13 to 17 fathoms, sheltered from south-westerly winds by the promontory.

The fortress, of considerable extent, is in a tolerable state of preservation and protected on all sides by steep cliffs 440 feet high ; it must formerly have been of great strength.

The village of Asso, is on the mainland, with a Custom-house and health office, and contains about 1,500 inhabitants who carry on a considerable trade in currants, raisins, wine, and oil. Small supplies of provisions and water can be obtained.

**The Coast** from port Asso trends northward for  $5\frac{1}{2}$  miles to cape Vlioti, the northern point of Cephalonia, already described at page 320 ; it consists of red cliffs from 50 to 150 feet high, with one or two small bays ; there are several villages a little inland, backed by well cultivated ridges. There are two little islets and one or two sunken rocks here and there close to the shore ; with these exceptions the coast is steep-to.

For the description of the eastern coast of Cephalonia, *see* Ithaca Chart, 203 [819].  
Var. 6° 10' W.  
channel, pages 320–323.

**ITHACA.**—This island retains its ancient name, and there is, perhaps, no place where the influence of classical associations is so lively or so pure. It is nearly 13 miles in length north and south, with an extreme breadth of 4 miles; is mountainous, and nearly divided into two distinct islands by the gulf of Molo on the eastern side, the northern part attaining the height of 2,066 feet in mount Anoge, and the southern half, 2,135 feet, in mount Stephano. Lat. 38° 22' N.  
Long. 20 41 E.

Currants are grown in large quantities, its wine is excellent, which, with a little oil, are its only exports. The inhabitants amounted to 13,286 in 1896, many of whom lead a seafaring life.

**Telegraph cables.**—The island is in telegraphic communication with Santa Maura and also with Cephalonia. The cable from the former is landed in Aphales bay, and the cable to the latter leaves the shore at the southern end of the isthmus of Ulysses and crosses the Ithaca channel to Samos bay.

**COAST.**—In general the coast is rocky with several indentations where country boats find shelter. The western coast runs nearly straight and parallel with the north-eastern coast of Cephalonia, from which it is separated by the Ithaca channel, varying from  $1\frac{1}{2}$  to  $2\frac{1}{2}$  miles in width, and fully described at pages 320–323. The eastern coast is irregular, and, near the middle, the gulf of Molo trends south-westward about  $3\frac{1}{2}$  miles, nearly cutting the island into two at its head, and leaving an isthmus only 4 cables across between it and Ithaca channel.

The shores of the gulf of Molo are steep and rocky, and the water deep. On its eastern side is the entrance to port Vathi, and at its head is the anchorage of Ex Aito bay. During gales from S.W. to N.W. the squalls blow down through the deep gullies of the high land with violence, causing the water to foam. In these gales, vessels unable to enter port Vathi will find anchorage in Ex Aito bay, where the squalls are not so heavy.

**ITHACA, North and East coasts.**—The western coast has been described with Ithaca channel, page 322.

**Aphales bay.**—At 2 miles north-eastward of Oxoi point, east point of entrance to Ithaca channel, is Marmaka point, the north extreme of Ithaca. Between the two points is Aphales bay,  $1\frac{1}{2}$  miles deep, open north-westward, with a sandy beach at its head, and beyond it the village of Oxoi; the eastern shore of the bay is a steep cliff terminating in Marmaka point. The telegraph cable from the island of Santa Maura is landed in this bay.

**Marmaka point,** the northern extreme of Ithaca, is a sharp projecting point clear of danger and steep-to, and on its eastern side is a cove. At  $1\frac{1}{2}$  miles south-eastward of Marmaka point is St. Nikolo point; the coast between is high and steep-to.

**St. Nikolo.**—On the southern side of St. Nikolo point is the little port of that name, circular, 2 cables in diameter, and with a sandy beach; it is fronted by a small islet and two sunken rocks, the entrance, which is along by the northern shore, being about a cable wide; within, there is an anchorage for small vessels in 5 fathoms. The water round the shore of Frikes bay is deep, and a short distance from it, but within the bay, there are depths of from 30 to 70 fathoms.

**Port Frikes.**—At  $1\frac{1}{2}$  miles south-eastward of St. Nikolo point is the termination of a tongue of land projecting to the northward; between Lat. 38° 27' N.  
Long. 20 41 E.

Chart, 203 [819].  
Var. 6° 10' W.

the two points is a bay receding  $1\frac{1}{2}$  miles, and at its head is the little port and village of Frikes, with anchorage in 3 fathoms water. Near the village are remains of ancient ruins.

The shores of Frikes bay are irregular, and small inlets afford two or three anchorages for coasting vessels.

Lat. 38° 27' N.  
Long. 20 43 E.

**Port Kioni**, situated about one mile southward of Frikes bay, is open to the north-east, 3 cables wide at the entrance, 6 cables deep, and clear all round; on its northern side is a remarkable round hill, and on its southern point of entrance are two windmills, by which the position of the port may be known. The village is at the head of the port, where the least depth of water is, from 2 to 4 fathoms, close-to; in the middle the depths are from 20 to 30 fathoms.

Between the southern point of entrance to port Frikes and the entrance to Kioni, there is a shoal with 5 fathoms water about 2 cables from the coast.

Plan of Gulf of  
Molo, 1,620 [823].  
Lat. 38° 23' N.  
Long. 20 42 E.

**GULF of MOLO**.—At one mile south-eastward of port Kioni is cape St. Elias, the northern point of the gulf of Molo. The cape is steep-to, and near it not much above the sea, is a white chapel; farther in on the highland is a windmill; from the cape, the coast trends south-westward 4 miles to the head of the gulf.

Skino point is the southern point of entrance and is  $2\frac{1}{2}$  miles from cape St. Elias; the point is the termination of a tongue of land forming a chain of low hills and half a mile south-eastward of it is a large rock or islet close to the shore, with shallow water extending half a cable outside it.

The island of Atoko, 5 miles north-eastward of cape St. Elias, serves as a mark for the position of the gulf; see view of the entrance to the gulf on plan.

The land on the northern side of the gulf is high and rises in ridges with deep ravines, and the coast is straight and everywhere steep-to. On the southern shore are three separate anchorages, Skino bay, port Vathi, and Ex Aito bay.

Lat. 38° 23' N.  
Long. 20 40 E.

**Skino bay**.—Half a mile south-westward of Skino point is Nera point, and a quarter of a mile beyond it is Andrea point; between Skino and Nera points is Skino bay, open north-westward and half a mile deep, with Neios and Skyro coves, two little sandy bays in either corner at the head. In the middle of the bay, the depth is from 32 to 40 fathoms, and a long cable from the beach in either cove there is 20 fathoms. The hill over the bay on its southern side is 553 feet high and rises  $4\frac{1}{2}$  cables from Andrea point.

**Lights**.—Near the extreme of Andrea point, north side of the entrance to port Vathi, is a small white circular tower, from which is exhibited at an elevation of 30 feet above the sea a *fixed white* light, visible in clear weather from a distance of 6 miles.

Near the northern corner of the prison in port Vathi is a stone column, from which is exhibited, at 13 feet above the sea, a *fixed red* light, visible 2 miles.

Lat. 38° 22' N.  
Long. 20 44 E.

**PORT VATHI**, on the south-eastern side of the gulf of Molo, is a snug land-locked little basin. The entrance may be known by the lighthouse on Andrea point on the northern side, and by the small rocky islet Katzurbo-nisi on the south; the channel in, from the northern end of the islet, is 6 cables in length, and narrows to barely  $1\frac{1}{2}$  cables in width, with depths of 36 fathoms decreasing to 21 fathoms.

Within, the port is  $5\frac{1}{2}$  cables long and  $4\frac{1}{2}$  cables wide, but it narrows and shoals rapidly towards the head, the depth of water, except near its head, being from 10 to 17 fathoms, mud bottom.

On the south-western side of the port, is a square islet on which is the prison, formerly a lazaretto, and harbour light before alluded to; the water between it and the shore is shallow. Plan of Gulf of Molo, 1,620 [323].  
Var. 6° 10' W.

**The town**, which encircles all the southern and south-eastern part of the port, consists of white houses built of stone and is clean and neat, with well-paved streets. The principal part of the town is not much above the level of the water, but, on the western side, many houses are erected on the ascent of the hill. At the back of the town are large gardens and currant grounds.

The population is about 5,500, a large proportion of whom lead a sea-faring life. Small quantities of provisions may be procured, but water is scarce.

**A wharf** on the southern side admits of small vessels lying alongside to load and discharge.

**Anchorage**.—Vessels of war usually anchor north-eastward of the prison in depths of from 13 to 15 fathoms. Small vessels lie closer in, in 3 or 4 fathoms. At times it blows hard with very heavy north-westerly squalls, for which vessels should be prepared.

**Ex Aito bay** is the inner anchorage in the gulf of Molo, and lies at its south-western extreme at the foot of mount Aitos, a round hill 400 feet high, which rises in the middle of the isthmus of Ulysses uniting the two parts of Ithaca; along the head of the bay is an extensive beach, off which at 2 or 2½ cables there is anchorage in depths of from 14 to 19 fathoms, sand; farther out the water is deep. On the summit of the hill are the ruins of the castle of Ulysses. Lat. 38° 22' N.  
Long. 20 42 E.

**COAST**.—At 2½ miles south-eastward of Skino point at the entrance to the gulf of Molo, is the projecting point of Sarakaniko with a bay on its southern side, but with no anchorage, it being open to the south east. At 2¾ miles farther southward is Iganni point, the south-eastern extreme of Ithaca; between the two points is Parapigadi islet about 4 cables in length and a cable from the coast, with 2 fathoms water between it and the shore; small coasters anchor in this narrow passage which is known as port Lia. There is nothing remarkable from Skino point southward, the coast is irregular and the water everywhere deep. Chart, 203 [819.]

---

General chart, 1,800 [815].

## CHAPTER XII.

THE ISLAND OF ZANTE, GULFS OF PATRAS AND CORINTH,  
AND COAST OF THE MOREA FROM CAPE PAPAS TO  
CAPE MATAPAN.

Chart, 207 [834].  
Lat. 37° 45' N.  
Long. 20 46 E.  
Var. 6 10 W.

**ZANTE.**—General remarks.—This island, ancient *Zakynthos*, is separated from Cephalonia by a deep and clear channel, 8 miles wide. Its extreme length between cape Skinari on the north and cape Ieraki, its south-eastern point, is  $19\frac{1}{2}$  miles in a north-west and south-east direction; its extreme breadth is about 9 miles. Its western part is mountainous, the greatest height, mount Vrachonis, about one-third from the northern end, being 2,724 feet above the sea; the eastern part is mostly an extensive plain covered with olive groves and richly cultivated vineyards. Mount Skopo, 1,621 feet high, is a remarkable isolated conical peak, the ridge extending from it terminating 4 miles south-eastward of its summit in cape Ieraki, the south-eastern extreme of the island.

Traces of volcanic agency are visible in many parts of the island and it is subject to severe earthquakes; that which occurred in 1840 split part of the high hill at the back of the town, and destroyed and shook many houses. The pitch wells near Kieri bay at the south-western end of the island, mentioned by *Herodotus*, are several circular pits in and near an extensive marsh; these wells were worked for some time, and large quantities of pitch and petroleum obtained, but the work has long since been abandoned.

The chief produce of the island is currants and wine, olives, oil, and soap.

**The population** of Zante by the census of 1897 was 41,957.

Charts,  
207 [834],  
203 [819].  
Lat. 37° 56' N.  
Long. 20 42 E.

**Cape Skinari**, the northern extreme of Zante, distant 8 miles from the nearest part of Cephalonia, is bold, cliffy, about 200 feet high, appears flat on the surface, and has deep water close to. From the cape, the eastern coast of the island trends south-eastward, with an inward curve for  $12\frac{1}{2}$  miles to Krionero point, the northern extreme of Zante bay.

**LIGHT.**—On cape Skinari stands a circular lighthouse with dwelling attached 30 feet high, from which, at an elevation of 218 feet above the sea, is exhibited a *white flashing* light showing about *fifty* flashes a minute, visible in clear weather from a distance of 20 miles between the bearings of N. 70° E., through east and south, to N. 40° W.

**East coast of Zante.**—St. Nikolo islet,  $1\frac{1}{2}$  miles south-eastward of cape Skinari, is about a cable from the coast and covers a cove suitable for boats. Nearly 2 miles farther on is Katastari point, projecting northward and forming a bay open in that direction, fit only for small coasters.

This coast is rocky with cliffs, and just northward of Katastari point is a large rock, 10 feet high, close to the shore. Chart, 207 [934].  
Var. 6° 10' 37".

Next follows Alilas bay, receding about a mile and having a beach more than 2 miles in length, with salt pans near the shore at its head, from whence the extensive valley or plain extends south-eastward throughout the south-eastern part of the island. With off-shore winds, there is good anchorage in Alilas bay a short mile from the shore in depths of 10 to 14 fathoms, good holding ground; small vessels anchor closer in. From Alilas bay, a range of small hills and slightly irregular shore, with cliff and beach, bordered by shallow water extending some distance off, trends south-eastward to Trenta Nove, a small round islet close to the shore, 84 feet high, with a chapel on its summit.

**KRIONERO POINT**, rather low, and surrounded by shallow water to the distance of about  $2\frac{1}{2}$  cables, has near its extreme a quadrangular yellow lighthouse 25 feet high; the land from the point gradually rises to the Castle hill. Plan of Zante  
bay, 1,762 [835].  
Lat. 37° 48' N.  
Long. 20 54 E.

**LIGHT**.—From the lighthouse on Krionero point, is exhibited at an elevation of 75 feet above the sea a *fixed and flashing* light, showing *fixed white* with a *red flash* once every minute. The light is visible in clear weather from a distance of 11 miles, between the bearings S. 43° E., through south and west, to N. 6° W. A faint light, however, can be seen in-shore of the bearing N. 6° W., possibly even from the mole of Zante harbour. Reported irregular 1902.

**ZANTE BAY**, between Krionero and Davia points, is 3 miles wide, semicircular, and recedes  $1\frac{1}{4}$  miles. In passing Krionero point from the northward, the town and castle of Zante open out and have a very pleasant and picturesque aspect. Lat. 37° 47' N.  
Long. 20 55 E.

**The Mole** projects nearly 3 cables south-eastward of the middle of the town front, affording shelter to small vessels against the strong north-easterly or gulf winds, which at times send a heavy sea into the bay. There are depths of 10 to 14 feet along the inner part of the mole; the molehead is steep-to, with 29 to 30 feet close around.

A small breakwater projects eastward from the vicinity of San Dionisio church, near the mouth of the San Caralambo river, from which stream much silt is deposited in the harbour. Dredging operations are in progress to deepen the port.

**Light**.—On the mole head, from an iron pillar, painted red, a *fixed red* light is exhibited at an elevation of 30 feet above the sea visible in clear weather from a distance of 6 miles.

**Dimitri shoal**.—The southern shore of the bay is bordered by shallow water, and is rocky in places. At about 5 cables S.E. by E.  $\frac{1}{4}$  E. from the mole head, and the same distance from the nearest shore, is the north-eastern end of this rocky shoal, which is rather less than a cable in extent north-east and south-west, and with 7 feet least water.

**Buoy**.—The Dimitri shoal is marked by a white buoy, in 6 fathoms, half a cable from its north-eastern edge; not to be depended on.

**Directions**.—Vessels from the north-eastward bound for Zante bay should give Krionero point a wide berth, as a rocky shoal extends some  $2\frac{1}{2}$  cables off-shore. The first hill southward of the northern extreme

Plan of Zante  
bay, 1,762 [835].  
Lat. 37° 47' N.  
Long. 20 55 E.  
Var. 6 10 W.

of Zante should be kept well open of Trenta Nove islet until the southern bastion of Zante castle is open of the eastern bastion, and the point should not be rounded in less than 15 fathoms water.

From the southward, give Vasiliko point a wide berth and keep Trenta Nove islet open of Krionero point N.W.  $\frac{1}{4}$  N.; when the molehead bears westward of W.N.W. and is on with the southern end of the castle, a vessel is well clear of Dimitri shoal and may steer into the bay.

**Caution.**—Care is necessary when navigating near these shores, as the buoys marking the shoals are often out of position and the lights are not altogether reliable.

**Anchorage.**—Zante bay is exposed to winds from North, round by east, to S.E. The usual anchorage is north-eastward of the molehead in a depth of 7 to 10 fathoms, mud and sand. Small vessels anchor off the molehead, in 5 or  $5\frac{1}{2}$  fathoms, sandy mud.

A fair berth for a large vessel, in about 10 fathoms, is with Krionero point lighthouse bearing N. by W.  $\frac{3}{4}$  W., and the molehead light S.W.  $\frac{3}{4}$  W. The tower of San Dionisio church, close to the shore half a mile southward of the mole, is square with a pointed top, and yellow in colour; it is a very conspicuous object in approaching Zante bay from any direction.

**Telegraph Cables.—Buoys.**—Telegraph cables are laid from Zante to Otranto, Corfu, Cephalonia, Patras, cape Trepito, Katakolo, Crete, and Malta. Ships anchoring in Zante bay must be careful to avoid fouling them. The cables belonging to the Greek government leave the shore about half a mile north-westward of Krionero point and are well clear of the anchorage, but in the bay itself four telegraph cables leave the shore at the telegraph office, about  $4\frac{1}{2}$  cables northward of the molehead light, in a north-easterly direction, three of them turning in westward round Krionero point, the fourth, the Malta cable, turning out south-eastward into deep water; the position of these cables is indicated by three buoys numbered 1, 2, and 3 from the southward, each with a staff and cross. The outer cable passes outside Nos. 1 and 2 buoys and close inside No. 3. A protecting chain is moored from 50 to 80 yards outside the cables from abreast of No. 1 buoy to nearly abreast of No. 2. See plan.

**Caution.**—Vessels are prohibited from anchoring near the telegraph cables.

**The town of Zante** extends in a semicircle along the shore of the bay for about  $1\frac{1}{2}$  miles, is well built and clean, with several churches and fine old Venetian buildings; the Pratique office, custom house, and post office are near the inner end of the mole. The population of the town was 15,442 at the census in 1897.

From the Castle hill, the extensive cultivated plain with the green slopes of mount Skopo form a splendid panoramic view. At the foot of the mount is Davia point, which is bluff, skirted by rocks, and is the termination of the sandy beach extending along the southern shore of the bay, of which it is the south-eastern extreme.

Zante has ample means of communication, the Austrian Lloyd's and Greek steamers calling regularly; it is the focus of the telegraphic system of this part of the Mediterranean. This is the only port of exportation in the island, and, in September and October, during the currant season, is a busy place.

---

**No. 1368.—ZANTE BAY—EXISTENCE OF TELEGRAPH CABLE BUOY.**

*Position.*—At a distance of 7 cables and 35 yards,  $22^{\circ}$  (*N.  $27^{\circ}$  E. Mag*)  
from the mole light.

*Description.*—Conical buoy with staff and cross.

Chart No. 1762.

Med. 3. p. 336

(10839.) Wt. 33446—329. 3625. 1/15. W. & S., Ltd.

t



**Trade.**—The exports are, currants, pyrene and olive oil, and soap, to the value of 172,224*l.* in 1907. The imports are, cereals, cotton and woollen goods, salt fish, iron, sugar, coffee, timber, &c.

Plan of Zante bay, 1,762 [835].  
Var. 6° 10' W.

Forty-three vessels entered and cleared, of 63,060 total tons.

**Consulate.**—A British Vice-Consul is stationed at Zante.

**Quarantine.**—Vessels arriving from suspected ports perform their quarantine of observation here; but those from infected ports are sent to Corfu, Trizonia, or Delos to perform their quarantine.

**Hospital.**—There is a municipal hospital at which sailors are received by consular request; payment for board and medicine is required.

**Coal and Supplies.**—The quantity of coal in stock varies considerably, but may amount to from about 1,400 to 2,000 tons; it is delivered alongside in lighters at about 22*s.* 6*d.* per ton. Destroyers could coal alongside a wharf at the inner end of the mole. Provisions and all other necessities may be obtained. Water is supplied by tank vessels and lighters, it may also be procured from a spring at the watering place a little within Krionero point, but the supply is limited and not sufficient for a squadron.

**COAST.**—**Vasiliko point**, 3 miles south-eastward of Davia point, is a low tongue with sandy beach on either side and shallow water surrounding it at a distance of a quarter of a mile; between the two points the coast is bordered by a bank with sunken rocks here and there.

Chart, 207 [834].  
Lat. 37° 44' N.  
Long. 21 0 E.

**Cape Ieraki**, the south-eastern extreme of Zante, 2 miles southward of Vasiliko point, is a low cliff with the ruins of a house on its summit. As this point is low and is the termination of mount Skopo, from which it is distant nearly 4 miles, it is necessary at night or in foggy weather to be cautious in rounding it, as, from the south-west, the mount appears isolated.

**Southern coast of Zante.**—Between cape Ieraki and cape Marathia, 8 miles westward of it, the coast recedes 4 miles forming a bay in which are the two islets Peluso and Marathonisi. The land of mount Skopo bounds the eastern side of the bay, and that of mount Kieri the western side; at its head is a sandy beach, beyond which is the extensive cultivated plain which is the leading feature of the eastern part of the island. On the western side of cape Ieraki is a small circular cove followed by a cliffy shore as far as the sandy beach; from the cape this shore is everywhere bordered by shallow water and scattered sunken rocks; it is also shallow all round the beach for some distance off-shore.

The bay is seldom visited by vessels, as the holding ground, being sand and rock, is bad.

**Peluso islet**, lying W.N.W. distant 1½ miles from cape Ieraki, is a picturesque islet about 4 cables in length, 282 feet high, and terraced in places, with fruit trees and brushwood. On its northern side is a monastery in a sandy cove, from which, well kept paths lead to the prettiest parts; within the yard of the monastery is a well of good water.

Lat. 37° 42' N.  
Long. 20 57 E.

Half a mile W. by N. ½ N. of the islet is a shoal with two rocky heads at a cable apart and steep-to; the northern head has one fathom water at low tide, the southern head 2½ fathoms.

Chart,  
207 [834].  
Lat. 37° 41' N.  
Long. 20 51 E.  
Var. 6 10 W.

**Kieri bay.**—**Marathonisi**, in the western part of the large southern bay, is about half a mile in length north-west and south-east, 488 feet high, with an old tower on its summit, steep, with cultivated terraces, and here and there olive trees.

The islet is connected with the mainland of Zante on its northern side by a rocky reef having from one to 3 fathoms water, and thus forms with the coast on the western side, distant three-quarters of a mile, Kieri bay. In the north-western part of the bay is port Kieri, off which there is anchorage, in a depth of 7 fathoms, half a mile from the shingle beach.

Lat. 37° 39' N.  
Long. 20 50 E.

**Cape Marathia.**—The coast from port Kieri trends south-eastward for  $1\frac{1}{2}$  miles and then curves southward and westward round the foot of mount Kieri, the limestone ridge 1,450 feet high immediately over it, of which cape Marathia is the southern extreme; the coast of the cape is bold, rising in steep cliffs, with deep water close to.

**West coast of Zante.**—From cape Marathia, the coast turns suddenly north-westward in bold rugged cliffs from 100 to 300 feet high, for 14 miles from Vromi, a small cove about 3 cables deep with steep cliffs, where fishing boats occasionally resort.

Lat. 37° 49' N.  
Long. 20 38 E.

The little rocky islet of Aggi Yanni, 110 feet high, is on the northern side of the entrance to the cove and is connected by rocks with the coast. At  $4\frac{1}{4}$  miles beyond the islet and about  $3\frac{1}{2}$  miles from cape Skinari is a little projection of the coast with the ruins of a church on it; the cliffy coast continues to the cape. The water all along the western coast of Zante is very deep, the 100-fathoms contour-line of soundings curving from less than half a mile to little more than a mile from the land.

Lat. 37° 55' N.  
Long. 21 0 E.

**MONTAGUE ROCKS**, in Zante channel, within the depth of 5 fathoms, extends over a space of 5 cables in a north and south direction, and is steep to. The least depth found,  $2\frac{3}{4}$  fathoms, lies with Kaufkalida island bearing N. 80° E., distant 6 miles.

The southern patch, with  $3\frac{1}{4}$  fathoms, lies  $3\frac{3}{4}$  cables from the least depth.

These dangers should be given a wide berth, especially by sailing vessels, as the current, with southerly winds, is strong in their vicinity. Small country vessels occasionally anchor on the sandy patches.

**Clearing marks.**—To avoid these rocks at night northward or southward, keep out of the *red* sector of Kaufkalida light shown between the bearings of N. 72° E. and East.

Krionero point light bearing S.S.W.  $\frac{3}{4}$  W. leads a mile westward of them, and bearing S.W.  $\frac{1}{4}$  W. nearly the same distance eastward.

Lat. 37° 15' N.  
Long. 21 0 E.

**STROVATHI ISLETS**, ancient *Strophades*, are two small rocky islets lying S. by E. distant 25 miles from mount Kieri, at the southern end of Zante.

Stamphani, the larger islet, is nearly 7 cables in length east and west, and on its steep western end, the highest part, is a lighthouse. The coast of the islet is rocky with cliffs; not far from a cove about 2 cables westward of the north-eastern extreme, is a fortified monastery of white stone about 88 feet high, with a flagstaff on it. This building can be seen in clear weather from a distance of 12 or 13 miles; *see* view on chart, No. 207. Stamphani is supplied with water from some remarkable springs.

Harpy, the northern islet, is much smaller and lower than Stamphani, and is separated from it by a space of  $3\frac{1}{2}$  cables; its north-western part terminates in a low sandy tongue.

The two islets are connected by a shallow ridge with numerous rocks above and below water and extending 3 cables south-westward from Harpy islet, and from thence around the western point of Stamphani; these rocks choke the passage between the two islets, except for boats, though a vessel of light draught might thread her way through in fine weather. The route is southward of the Kaleroo rock lying between the two islets, but it should not be taken without local aid. Around these islets and rocks at a short distance the water is very deep.

**Temporary anchorage.**—There is indifferent anchorage on the eastern side, northward of the monastery, in 7 to 15 fathoms water, sand and weed. It should be approached with care as the water is deep, the 50-fathoms line of soundings passing about 3 cables from the north-eastern extreme of Stamphani. The landing place is in the cove near the monastery, where there is a boat slip and pier.

**LIGHT.**—The lighthouse at the summit of the west end of Stamphani islet is a white square building 36 feet high, from which is exhibited, at an elevation of 127 feet above the sea, a *fixed white* light varied by a *red flash of eight seconds* duration, once every *minute*; it is visible in clear weather from a distance of 17 miles. (Reported irregular and visible only 10 miles, 1905.)

**The GULF of PATRAS** may be said to commence at Oxia island (described at page 319) on the north, and at cape Papas on the south-east, which are 13 miles apart on an E.S.E. bearing. The northern coast from Oxia island to the entrance of the gulf of Lepanto is  $31\frac{1}{2}$  miles in extent; whilst from cape Papas to the entrance of that gulf the distance is only  $20\frac{1}{2}$  miles, the land between on the southern side receding and forming a bight about  $6\frac{1}{2}$  miles deep. The shores on either side are generally low but backed by high land, and the depth in the entrance nowhere exceeds 30 fathoms, though within it there is, in places, over 70 fathoms.

**Northern shore of the gulf.—Scropha point and shoal.**—Scropha point at the north-western side of entrance to the gulf and 2 miles eastward of the southern end of Oxia island, is low and sandy, and within it is an extensive lagoon and fishery. A narrow strip of land, forming the southern part of port Scropha, projects northward from Scropha point terminating in Look-out hillock, 127 feet high, which from a short distance appears as an island.

Port Scropha is now only fit for boats, but about a century ago was sufficiently deep for large brigs; it has been filled in by the alluvium brought down by heavy rains.

Scropha point is surrounded by an extensive sandy shoal, with less than 3 fathoms water, shoaling suddenly from 8 fathoms off its south extreme, which is steep-to: the shoal extends  $1\frac{1}{10}$  miles southward of the point and about three-quarters of a mile off the shore eastward of it.

**Clearing mark.**—The western summit of Petala island, the north summit of Dioni peninsula, and the north-east extreme of Oxia island in line, bearing N.  $8^{\circ}$  W., leads 4 cables westward of Scropha shoal; and cape Oxia, bearing northward of N.W. by W.  $\frac{1}{2}$  W., leads southward of the shoal.

Chart,  
1,676 [826].  
Lat. 38° 19' N.  
Long. 21 9 E.  
Var. 6 0 W.

**Mount Kutzulari**, a sharp isolated hill, 1,424 feet high, rises  $1\frac{1}{2}$  miles northward of Scropha point, and in conjunction with the northern peak of Oxia island, 1,380 feet above the sea and 2 miles farther westward, forms a good landmark. *See view A on chart.*

**The Coast** between Scropha point and Tholie island,  $7\frac{1}{2}$  miles eastward, is very low with sandy hillocks and is covered with brushwood and coarse vegetation; within it are lagoons and extensive fisheries. The water near the shore is shallow, but it shoals gradually.

**Scropha anchorage.**—There is temporary anchorage in depths of 7 to 12 fathoms about  $2\frac{1}{4}$  miles eastward of Scropha point, and, if necessary, anywhere along the shore. About 4 to 5 miles eastward of the point the shoal water extends a mile from the shore, there being only 4 fathoms at that distance.

In approaching any part of the low shore on the northern coast of the gulf, attention should be given to the lead, as there is every indication of the shallows gradually extending southward.

**MISSOLOGHI APPROACH.** — **Sosti and Turlide islands.**—Eastward of Tholie island are the three sandy islets of Kalamurto, Sosti, and Turlide; on the eastern extreme of Sosti stands a white lighthouse, and at Turlide is a landing pier for Missolonghi, with a light. Here is the health office and custom house.

Lat. 38° 19' N.  
Long. 21 23 E.

**LIGHTS.**—From a white circular tower, 37 feet high, on Sosti island, on the western side of the entrance to Missolonghi lake, is exhibited at an elevation of 40 feet above the sea, an *occulting* light every *three seconds*, thus:—Light, *two and a half seconds*, eclipse, *half a second*, which shows *white* when bearing from N. 61° E. to N. 19° E.; *red* from N. 19° E., through north, to N. 60° W.; obscured elsewhere. The *white* light is visible in clear weather from a distance of 11 miles, *red* light at 9 miles.

At the landing place for Missolonghi, on Turlide island, a *fixed red* light is exhibited from a mast, at an elevation of 25 feet above the sea, visible in clear weather from a distance of 6 miles. (Reported not visible at 4 miles, 1899.)

Lat. 38° 18' N.  
Long. 21 21 E.

**Anchages.** — Between Tholie and Sosti islands is Turli anchorage, usually taken in a depth of 6 or 7 fathoms, sand and mud; inside the 5-fathoms line, it shoals suddenly. Small vessels anchor in 5 fathoms a short mile eastward of Tholie, somewhat protected by that island and by the shallow ground extending nearly a mile southward of it. The anchorage abreast the end of Missolonghi causeway is known as Turlide anchorage.

**Directions.**—Mount Zyrgos, 3,100 feet high, bearing N.N.E. leads to Turlide anchorage for Missolonghi.

Approaching Turli anchorage, at night, with Sosti island light in sight, showing *white*, a vessel will pass southward of the shoals extending off Tholie island, on the port hand, and westward of the shoals extending westward of cape Papas.

**Buoys.**—Two mooring buoys for the use of small coasting steamers are placed off the pier at Turlide island in about  $2\frac{1}{2}$  fathoms water; one is situated S. by W. distant 6 cables, the other South 8 cables from the pier-head.

**MISSOLONGHI LAKE** is an extensive sheet of water with numerous islets and mudbanks; the navigation is intricate and only available for boats by the staked passage. Anatoliko lake, northward of Missolonghi lake, is reached by a boat channel  $1\frac{1}{2}$  feet deep, through the mud flats; in the middle of the lake is an island, on which is the town of Anatoliko, containing 2,500 inhabitants and connected on either side with the mainland by stone bridges. Fish in large quantities are caught in these lakes. Fever is prevalent in the summer months.

**The town** of Missolonghi stands on a low swampy point nearly 4 miles north-eastward of Sosti island lighthouse, and contains about 6,000 inhabitants; the houses are badly constructed and the streets irregular; there is but little trade.

About 2 miles eastward of Sosti lighthouse is a small pier; the health office and two or three other houses are near the pier, and from it a causeway leads direct to Missolonghi,  $2\frac{1}{2}$  miles distant.

Missolonghi is in communication with other parts of Greece by electric telegraph, and steam-vessels call off the coast regularly.

**Consulate.**—A British Vice-Consul resides at Missolonghi.

**COAST.**—**Bukari point.**—The coast eastward of Turlide or Missolonghi lighthouse is a low sandy shore with inlets to the lakes and swamps which are here and there staked with fish weirs. Bukari point, at the western side of the entrance to the river Phidaris, is low and of shingle; on the beach about a mile westward of it is a ruin. The beach between the point and house is bordered by shallow water extending about half a mile southward and steep-to.

There is said to be a beacon on Bukari point.

**LIGHT.**—From a metal column, about 20 feet high, with iron hut attached, on Bukari point, a *fixed red* light is exhibited at an elevation of 27 feet above the sea, visible in clear weather from a distance of 7 miles.

**Clearing marks.**—To pass clear and westward of Bukari point shoal, keep Sosti island light in sight (showing *red*) bearing northward of N.  $60^{\circ}$  W., or the same bearing of the lighthouse by day, when abreast or westward of the point.

**Phidaris river**, ancient *Evenos*, is navigable in boats for  $1\frac{1}{2}$  miles; the water is fresh but muddy. In the vicinity of the coast the land is low, with cultivation and villages here and there; on the west side of the river, for 2 miles from its mouth, it is marshy, but wooded inland; eastward of the river, it is thickly covered with olive trees and partially cultivated as far as the foot of mount Varasova. The hills northward of the low land are covered with pine trees.

**Calydon bay.**—From the mouth of the river Phidaris, the low wooded shore trends eastward for  $5\frac{1}{2}$  miles to the eastern point of Calydon bay; it is bordered throughout by shallow water, 3 fathoms and less, to nearly a mile from the shore, with a tendency to grow outwards. Caution is therefore necessary in this vicinity.

Calydon bay is a bend in the shore under the south-western face of mount Varasova; it affords anchorage for very small craft in the north-western part, off the mineral spring of Krionero. Water may be obtained from numerous springs running into the bay.

**Mounts Varasova and Kakascala.**—The low coast is all along backed by high land, and at 10 miles northward of Bukari point,

Chart,  
1,676 [826].  
\*Lat. 38° 22' N.  
Long. 21 40 E.  
Var. 5 50 W.

mount Zyrgos rises to a height of 3,100 feet; and, to the south-eastward, rising immediately over the sea, are the conspicuous mountains Varasova and Kakascala,\* large masses of rock respectively 3,160 and 3,300 feet high, the latter forming a triangular peak. *See* views on chart.

**Basiliki bay** is separated from Calydon bay by the steep cliffy termination of mount Varasova. On the eastern slope of this mountain, near the sea, are the remains of several Hellenic buildings; and, in calm weather, extensive ruins may be seen under water near the cliffs, probably the ruins of the ancient city of Chalcis.

Basiliki bay is the indentation between the south-eastern termination of Varasova and the steep coast of mount Kakascala, which rises abruptly from the sea; between the two mountains is a deep valley. The bay affords anchorage for small vessels except when the wind blows hard from the gulf of Lepanto, which causes a heavy surf. Water may be obtained from a clear stream on the eastern shore of the bay.

Chart,  
427 [829].  
Lat. 38° 20' N.  
Long. 21 45 E.

**The Narrows.—Rumelia castle.**—From Basiliki bay, the coast for about  $2\frac{1}{2}$  miles is the base of mount Kakascala, then follows a low, broad, sandy beach for nearly  $3\frac{1}{2}$  miles to Anti Rhion point on which stands Rumelia castle, north side of the narrows, or the entrance to the gulf of Corinth. From about a mile eastward of Basiliki bay, the shore is bordered by a bank which here extends off about 2 cables and continues eastward to Rumelia castle; but  $1\frac{1}{2}$  miles westward of the castle the coast bank extends southward about half a mile to the 5-fathoms line.

**LIGHT.**—On Anti Rhion point, at the southern angle of Rumelia castle, is exhibited a *fixed white* light, elevated 38 feet above the sea, and visible in clear weather from a distance of 6 miles.

**Morea castle** stands on Rhion point, on the southern side of the Narrows, at the entrance of the gulf of Corinth; it is used as a prison. From the castle, the low shore trends south-westward 4 miles to the mole of Patras.

Chart,  
1,676 [826].  
Lat. 38° 13' N.  
Long. 21 22 E.

**SOUTHERN SHORE.—CAPE PAPAS.—Shoal.**—Cape Papas, the termination of the ancient *Araxos* promontory, forms the southern point of entrance to the gulf of Patras. It is a low shingle spit surrounded by a reef extending nearly three-quarters of a mile westward, and more than half that distance northward, the water deepening suddenly at its edge.

**Clearing marks.**—Sosti white lighthouse bearing eastward of N.N.E., leads well to the westward of the reef.

East bluff,  $4\frac{1}{2}$  miles eastward of cape Papas, bearing southward of S.E. by E., leads northward of the reef; *see* view B with Sosti lighthouse on chart. At night, Sosti light bearing eastward of N. 19° E., showing *white*, leads westward of Papas reef; when cape Papas light bears S.E., course may be altered for Patras.

**LIGHT.**—Near the extreme of the low sand spit of cape Papas is an iron column, from which is exhibited at an elevation of 30 feet above the sea, a *fixed red* light, visible in clear weather from a distance of 8 miles.

Lat. 38° 12' N.  
Long. 21 25 E

**Temporary anchorages.**—Karavastasi bay, eastward of Rocky point, 104 feet high with a ruined tower, affords shelter with westerly and southerly winds, but it cannot be recommended as an anchorage, as the wind frequently, and with scarcely any warning, shifts suddenly to the north-east, and blows furiously with a heavy short sea. Lake Kalogria lies just within the beach of this bay.

South-westward of cape Papas, during strong gulf winds, there is well-sheltered anchorage, in a depth of 9 to 12 fathoms, sand.

Chart,  
1,676 [826].  
Var. 5° 50' W.

**Current.**—In the vicinity of cape Papas a strong current is experienced, caused almost entirely by the wind; with fresh north-easterly or gulf winds, it runs westward at more than  $1\frac{1}{2}$  miles an hour, and eastward with north-westerly winds. An eddy or counter current, before alluded to, sweeps round the southern side of the bay, towards or from Patras as the case may be, in the opposite direction to the wind. At Patras, during north-easterly winds, it occasionally runs strongly to windward; and, at times, in moderate weather, the current changes periodically and so regularly as almost to partake of the nature of tidal streams.

For the continuation of the coast of the Morea southward of cape Papas, see page 358.

**PATRAS ROADS AND HARBOUR.**—The anchorage for large vessels in Patras roads is westward of the breakwater or north-westward of San Nicolas mole, in depths of 12 to 16 fathoms, mud and sand. With the wind from the eastward, commonly called the gulf wind, neither wind nor sea comes home. During autumn and winter, should it be necessary to moor, the anchors should be E.N.E. and W.S.W. of each other; and, if any stay is to be made, the swivel should be put on, as the winds are variable.

Plan of Patras  
roads,  
1,225 [827].

**Harbour.**—The harbour is formed by three moles each about 500 yards apart at the base, extending in a north-westerly direction, fronted by a breakwater 1,000 yards in length. San Nicolas, the centre mole, about 20 yards in breadth, projects 300 yards at right angles to the beach from about the middle of the town near the health office; Kalavrita, the south-western mole, about 230 yards in length, is parallel to San Nicolas mole; and the North mole juts out about 140 yards abreast the north end of the breakwater. It is proposed to prolong the breakwater about 800 yards in a northerly direction and to construct additional harbour works on the main shore abreast.

When in the harbour both anchors should be down ahead, and the stern secured to bollards on the mole. The anchors should be well ahead, as it blows strongly sometimes from the westward (taking the vessel on the beam), and causes the anchors to come home.

**Moorings.**—There are several mooring buoys in the harbour convenient for shipping.

**LIGHTS.**—From a gray stone tower on San Nicolas molehead, 40 feet high, a *fixed white* light varied by a *flash* every *ninety seconds*, is exhibited at an elevation of 55 feet above the sea, visible in clear weather from a distance of 12 miles.

At the north end of the breakwater is a *fixed green* light, elevated 29 feet above the sea, exhibited from a wooden support, visible 4 miles; at the south-western end are two *fixed red vertical* lights at an elevation of 34 feet, exhibited from a metal column on an iron hut, visible 7 miles.

On the north molehead, a *fixed red* light is exhibited from a metal support on stone base, at an elevation of 26 feet above the sea, visible 5 miles.

On Kalavrita molehead, elevated 29 feet above the sea, a *fixed green* light is exhibited from a lamp-post, visible 4 miles.

On St. Andrea mole, 98 feet within its extreme, two *fixed green* lights, visible 6 miles, are exhibited from a metal column surmounting an iron hut, at an elevation of 33 feet, and visible 6 miles.

Plan of Patras,  
1,225 [827].  
Chart,  
1,676 [826].  
Var. 5° 50' W.

**Pilots.**—There are no licensed pilots, but one or two men are in the habit of acting as pilots. Vessels should communicate with the Captain of the Port before entering, as to the berthing of the vessel.

**Directions.**—There are no dangers in the approaches to Patras, having given a berth to the shore off cape Papas if coming from the southward, or that off Scropha point if coming from the north-westward. The red castle in ruins on the hill at the back of the town is fairly conspicuous. In the town, A. Pedalo (two white square towers) is the most conspicuous building, standing up clear of the houses. A. Pandocrato has three domes. One larger than the other two.

Plan of Patras,  
1225 [827].  
Lat. 38° 15' N.  
Long. 21 44 E.

**THE TOWN** of Patras, ancient *Patræ*, is next to Athens the largest and most populous town in Greece, it stands on the eastern coast and southern shore of the gulf of Patras at the foot of mount Voidias, which, about 7 miles to the eastward, rises to the height of 6,340 feet.

The town is well laid out, and the houses large though usually but one storey high, the streets wide, regular, and at right angles to each other, but are ill-paved and badly kept, as are those also in the country round. On a hill at the back of the town is the castle, probably on the site of the ancient Acropolis, but it is in a dilapidated condition. Large plains cultivated as vineyards extend on either side of the town.

**The population** in 1896 was 37,958, increased probably during the current season by another 5,000, principally labourers from Italy and the Ionian islands.

**Hospital.**—There is a municipal hospital at Patras open to patients of all nationalities.

**Communication.**—Patras is in direct railway connection through Vostitza and Corinth with Athens and also with Nauplia; in the opposite direction, with Katakolo and Pyrgos. It is in telegraphic communication with all parts of the world. Intercourse by trading steamers is also frequent with all the principal countries of Europe and with New York.

**Telegraph cables.**—The telegraph cables from Zante are landed at a spot about three-quarters of a mile north-eastward of San Nicolas molehead lighthouse; those from Patras to Corinth leave the shore at the same place and pass through the strait of Lepanto.

**NOTE.**—To avoid the telegraph cables vessels should anchor with the French Consulate bearing northward of E.  $\frac{1}{2}$  N.

**Consulate.**—A British Consul resides at Patras.

**Coal and Supplies.**—Coal for steaming purposes can always be obtained, about 2,000 tons being usually in stock. There is no coaling wharf, but from 500 to 600 tons per diem can be put on board from the hulks and by lighter; from the hulks at about 25s. per ton, and by lighter at about 3s. more. Water of excellent quality can be supplied by water boats, and may be obtained at the town with facility.

Provisions of all kinds are available in any quantity.

**Health.**—Patras formerly suffered from fevers, but since the land has been drained and the extensive marshes brought under cultivation, the health of the town has greatly improved, though during spring and summer ague is still rather prevalent, and against it quinine is the best specific.

**Trade.**—During the current season, steam vessels arrive here and take away annually about 120,000 tons of currants, of which about half is shipped in British bottoms. The total amount of British shipping entering the port for the year 1906 was 103 of an aggregate tonnage of 140,146; in addition, 92 vessels of other nationality loaded with 58,639 aggregate

tons of cargo. The principal exports are currants, valonia, figs, skins, tobacco, olive oil, &c. The imports are twist, cotton cloths, woollens, silk, iron, hardware, sulphur, timber, &c.

There is no dock accommodation, nor facilities for any but slight repairs to shipping.

**Quarantine.**—As with other Greek ports, vessels having to ride out quarantine are sent to Corfu, Trisonia, or Delos.

**Winds.**—The gulf or north-easterly wind blows nine months in the year in the gulf of Patras; it is first observed along the northern shore under mounts Kakasala and Varasova, whose summits at the same time, if the wind is of any force, become capped with clouds. Towards noon the breeze usually reaches the anchorage at Patras, and is succeeded by the land breeze at sunset. In summer the N.W. wind or sea breeze occasionally blows fresh. Wind from the south-east is hot and scorching, blows strongly, and shifts gradually towards the south-west, when rain, thunder, and vivid lightning usually set in for two or three days.

**Climate.**—In the months of July to September, 1893, the mean maximum temperature was about 82°, though occasionally it reached 90°. The nights were comparatively cool, temperature about 77°. The wind during the day was generally from the northward, going down about sunset; the nights were calm, or with light airs from the eastward.

**Meteorological Table.**—See page 376.

**The Coast** between cape Papas and Patras, a distance of 17 miles, forms a semicircular bay whose shores are generally low and sandy with soundings shoaling gradually towards them. The river Kommenitza, which flows into the gulf about midway, is an inconsiderable stream in summer, but is frequently a violent torrent in winter. During strong gulf winds, after passing cape Papas and by keeping close in along this shore, vessels carry a strong eddy current to the eastward round the bay towards Patras; the wind also is not so strong along this route, and at times a vessel in-shore may be almost becalmed when there is a strong breeze a mile outside. By standing across the gulf or along by the Missolonghi shore the full force of the wind is felt and a strong westerly current experienced. In case of necessity, there is anchorage all along the southern shore.

## GULF OF CORINTH.

**General remarks.**—This gulf or inland sea extends in an E.S.E. direction for about 70 miles from its entrance at the head of the gulf of Patras, where it is only one mile across the Narrows between points Anti Rhion on the north and Rhion on the south side, thence it increases in width varying from 2 to 5 miles as far as cape Psaromyta, 20 miles within on the north shore, when it further widens, averaging 9 to 10 miles to the head of the gulf.

The northern shore is irregular and indented with deep bays, but the southern shore is regular from the Narrows to Corinth bay, both shores are steep-to, and in the middle the depths range from 100 to 460 fathoms. The gulf is surrounded by bold, rugged mountains 4,000 to 8,000 feet high, at the feet of those on the southern shore there are narrow cultivated plains intersected by numerous torrent beds.

The Corinth canal at its head, page 354, shortens the distance to Athens from the west coast of Greece by about 150 miles.

**Winds and weather.**—During the summer the winds are usually light and variable, those from west and north-west are most prevalent,

Chart,  
1,600 [828].  
Var. 5° 50' W.

occasionally the wind from north-west blows strongly and raises a considerable sea in the eastern part of the gulf; during the night at this season it is generally calm.

In the western part of the gulf the prevailing wind is from north-east; it usually commences at sunrise and increases in force as the entrance is approached, when it forms the gulf wind of the gulf of Patras. During the summer, when there is often a fresh breeze in the middle of the gulf, it is calm in the bays of Salona and Aspra Spitia on the northern shore.

In the winter, winds from east-south-east are most prevalent, and are accompanied by a mild thick atmosphere and rain.

**Tides.**—The tidal action in the gulf though small is regular and clearly marked with a range at springs of a little over 2 feet.

**Currents.**—In the Narrows the current is tidal turning with the time of high and low water at Trisonia island on the north shore, setting into the gulf while the water is rising there and out when falling. At springs it attains a velocity of 2 knots, the direction and rate are both much influenced by the prevailing wind if strong. As the gulf widens east of Drepano point it soon ceases to be felt, and in the middle there is no regular current, but a slight drift is frequently set up by the prevailing wind. There is often a marked current setting close around the prominent capes on the northern shore, caused by the tidal stream setting out of the bays.

Plan of entrance,  
127 [829].  
Lat. 38° 23' N.  
Long. 21 49 E.

**THE NARROWS.**—**Naupaktos (Lepanto).**—From Anti Rhion, north side of the Narrows, page 342, the shore trends in a north-easterly direction 5 miles to Naupaktos, and consists of a shingle beach bordered by a shallow bank 2 to 3 cables wide. Mount Rigani, 4,828 feet high, lies 4 miles north-north-west of Naupaktos, and on a spur of this mount, 639 feet high, stands the ancient citadel from which the walls diverge downward, enclosing the old town. As viewed from seaward the walls present the form of a triangle with the citadel at its apex. A large portion of the modern town lies outside these walls to the eastward.

Steam vessels call occasionally, and the Greek steamer between Patras and Corinth calls once a fortnight.

**Anchorage.**—Vessels usually anchor from one-third to half a mile off the town in depths of 7 to 13 fathoms, but it is not a safe anchorage in bad weather with south-westerly winds. There is a small boat harbour, enclosed by the old walls, but it is very shallow and confined.

Lat. 38° 22' N.  
Long. 21 52 E.

**Morno point.**—From Naupaktos the shore trends in a south-easterly direction  $2\frac{1}{2}$  miles to Morno point, thence in a north-easterly direction for 3 miles to a red-coloured bluff 64 feet high. About midway between Naupaktos and Morno point is the delta of the river Morno, ancient *Hylætus*, the land from which to the Red cliff encloses the flat cultivated plain of Pilala.

From Naupaktos to the Red cliff the shore is bordered by a shallow bank from 2 to 4 cables wide, from the edge of which the water deepens suddenly, and after heavy rains it is discoloured for a mile or more from the Delta, and frequently extends round Morno point.

**A rocky patch**, with  $3\frac{3}{4}$  fathoms, lies S.  $\frac{1}{2}$  W.  $7\frac{1}{2}$  cables from the Red cliff, north-eastward of Morno point, and  $6\frac{1}{2}$  cables from the shore.

**LIGHT.**—On **Morno point**, from an iron column on a basement of white masonry, a *fixed red* light is exhibited at an elevation of 46 feet above the sea, visible in clear weather from a distance of 7 miles.

No. 1570.—MORNO POINT—NEW LIGHT ESTABLISHED.

*Position.*—On Morno point, in the position of the existing light.

*Details.*—The present fixed red light will be discontinued and replaced by a new light having the undermentioned characteristics:—

*Character.*—A group flashing white light showing a group of three flashes every fifteen seconds.

*Elevation.*—Not stated.

*Visibility.*—11 miles.

*Power.*—370 candles.

*Structure.*—White iron obelisk on concrete base.

*Remarks.*—The light will be unwatched.

Chart No. 427.

Med. 3, p. 346.

No. 1210.—Hence Power—New Light Measurement

Position.—On Morris Hill in the parish of the county of Middlesex.  
Details.—The present building was erected in 1850, and is  
situated on a hill rising from the level of the sea.

Construction.—The building is of brick, and is of the  
shape of a cross, the arms of the cross being 100 feet  
long, and the central tower 120 feet high.

Materials.—The building is of brick.

Height.—The height of the building is 120 feet.

Power.—The power of the building is 120 horsepower.

Structure.—The structure of the building is of brick.

Remarks.—The building is of brick.

Height 120 feet.

1850, 1851, 1852

**Drepano point** lies  $3\frac{1}{2}$  miles eastward of Rhion point, on the southern side of the entrance to the gulf; the shore between them is a low sandy beach in which are two bays. Drepano point projects northward towards Morno point, and is of low alluvial land with a spit extending 3 cables north-westward and terminating in a rock awash, with deep water close to.

Plan of entrance  
427 [829].  
Lat.  $38^{\circ} 20' N$ .  
Long.  $21^{\circ} 50' E$ .  
Var.  $5^{\circ} 50' W$ .

About  $1\frac{1}{2}$  miles eastward of Drepano point the low shore ceases and high land continues the whole of the distance to the bay of Corinth at the head of the gulf. A long white watercourse, running from near the summit of a mountain to the sea, south-eastward of the point, is conspicuous.

**LIGHT.**—On Drepano point, at 400 yards south-east of its extreme, is a round masonry tower with dwelling attached, from which, at an elevation of 30 feet above the sea, an *alternating white and green* light with a period of *five seconds* is exhibited, visible in clear weather from a distance of 11 miles.

**Directions for the Narrows.**—The castles of Rumelia and Morea at the entrance of the gulf of Corinth are easily recognised; steam vessels or sailing vessels entering with a fair wind should keep midway between the two and then steer about N.E. by E. until midway between Rumelia castle and Morno point, or at *night*, until the *white* light of the castle bears W. by S.  $\frac{3}{4}$  S. astern; then steer E. by N.  $\frac{3}{4}$  N. for Morno point light until within about  $1\frac{1}{2}$  miles of it, or until Drepano point light bears S.  $\frac{1}{2}$  E., when steer about E. by S. nearly in mid-channel, altering course as convenient.

In fine weather, with a foul wind, a sailing vessel should work along the Patrass shore and by the Morea castle until convenient to stand northward towards Naupaktos, which must depend on the direction of the wind and the strength of the current; the shore on either side should be approached with prudence, it being bordered by narrow banks, and the rock awash off Drepano point should be carefully avoided. During fresh north-easterly winds, when a strong current may be expected to set out of the gulf, anchorage will be found in Patras road.

**THE COAST** from the Red bluff trends in a general easterly direction for about 6 miles to abreast Trisonia island, and is steep to, the high land extending down from the mountains to the water's edge, except at Maratheas point, which is low and wooded, 3 miles east of the Red bluff. Hancock rock, with  $2\frac{1}{2}$  fathoms over it and deep water close around, lies 6 cables S.E. by E. from Maratheas point.

Chart.  
1,600 [828].

**Trisonia island**, situated  $8\frac{1}{2}$  miles eastward of Morno point, is 351 feet high,  $1\frac{1}{2}$  miles long north-west and south-east, and three-quarters of a mile across. It is separated from the mainland by a deep channel 2 to 3 cables wide; from the north-east part of the island a shoal extends a distance of  $1\frac{1}{2}$  cables, narrowing the deep water channel to a little over a cable in that part. The island appears low, being close under the high land extending down from mounts Trikorfu and Xeravuni, which are 5,094 feet and 4,510 high respectively. It is not easily distinguished from the mainland when seen from some distance westward, but may be recognised by the red colour of the cliffs on the south and west sides.

Lat.  $38^{\circ} 22' N$ .  
Long.  $22^{\circ} 4' E$ .

**Port.**—On the eastern side of the island is the village and secure little port of Trisonia, which is about 2 cables in extent, with depths of 2 to 3 fathoms in the middle; it is one cable wide at the entrance. There is a small islet 28 feet high just outside close to the southern shore. On the mainland, abreast the north-east part of Trisonia island, there are a

General chart, 1,800 [815].

Chart.  
1 600 [828].  
Var. 5° 40' W.

few houses close to the beach, where good water may be obtained from a well.

**H. Ioyannis island**, 146 feet high, lies nearly midway between the south-east end of Trisonia and the mainland; it is little over a quarter of a mile long east and west, and about half that distance across. The south side of the island is composed of a cliff, red on the east and white on the west side, the junction being well defined; half a cable north of the island there is a rocky patch with a small head one foot above water.

Lat. 38° 21' N.  
Long. 22° 7' E.

**Prasuthi island**, 111 feet high, one mile east of H. Ioyannis island, is 350 yards long north and south, and 150 yards across. A rock, 5 feet high, with deep water close around, lies 2 cables west of this island.

**Directions.**—Coming from the westward, the position of port Trisonia is indicated by mount Xeravuni, whose summit is  $3\frac{1}{2}$  miles north-eastward of Trisonia island; and on a near approach, the island and the passage separating it from the coast will be seen. In entering the passage, keep in mid-channel; but on approaching the eastern part, borrow on the mainland shore so as to avoid the shoal surrounding the north-eastern part of the island; when the south-eastern point of the island bears S.  $\frac{1}{2}$  E. and is well open of the point northward of it, steer to the southward for the port.

If approaching the port, passing southward of Trisonia, the island may be coasted along at a prudent distance and the deep and clear passage taken between it and H. Ioyannis island.

From the south-eastward, having passed cape Psaromyta, steer direct for Trisonia, and when in the vicinity of Prasuthi island, leave it on the starboard hand and enter the passage between it and Trisonia as before.

Lat. 38° 19' N.  
Long. 22° 10' E.

**Cape Psaromyta**, 5 miles south-eastward of Trisonia island, is the termination of the mountainous ridge extending from mount Xeravuni, which declines in three gradual slopes towards the sea, the ridge for three-quarters of a mile from the extreme of the cape is only 400 to 500 feet in height, when it abruptly rises to 2,000 or 3,000 feet. The cape is clear of danger and may be approached at discretion.

**LIGHT.**—On the extremity of cape Psaromyta stands a cylindrical tower 28 feet high, from which, at an elevation of 210 feet above the sea, is exhibited a *flashing white* light every *thirty seconds*, visible in clear weather from a distance of 21 miles. The *flashes* are of *ten seconds* duration, and visible from the bearing of S. 31° E., through east and north, to S. 52° W.

**Eratini and Kiseli bays.**—The coast between cape Psaromyta and cape Andromache 9 miles further east forms two principal bays separated by cape Vithavri. In the first of these, 3 miles north-east from cape Psaromyta, at the head of a small bay is the village of Eratini, the port of the larger village of Vetrinitza, which stands about  $1\frac{1}{2}$  miles from the beach, with a fertile valley extending north-westward between the mountains. The beach is steep, and exposed to south-easterly winds, but in fine weather small coasters anchor in a depth of 10 fathoms about a cable from the shore. The next small indentation of the coast, close eastward of Eratini, is Kiseli bay, in which the water is deep, but small vessels anchor off the beach in fine weather. A rocky islet 30 feet high lies close to the shore about a mile south-eastward of Kiseli bay, and

another, but smaller rock, 6 feet high, one cable south-east of cape Vithavri; with these exceptions, the coast is clear and the water deep all the way to cape Andromache. There is a remarkable bold bluff 820 feet high  $1\frac{1}{2}$  miles east of cape Vithavri. Chart,  
1,600 [823].  
Var.  $5^{\circ} 35'$  W.

**Vithavri bay**, situated nearly a mile north of cape Vithavri, is sheltered from all but south and easterly winds; the water is deep, but there is fair anchorage for small vessels in a depth of 13 fathoms  $1\frac{1}{2}$  cables from the beach. Lat.  $38^{\circ} 21'$  N.  
Long. 22 17 E.

**GULF OF SALONA**, the ancient gulf of Krissa, is contained between capes Andromache and Passalos 9 miles apart; the gulf recedes upwards of 9 miles to its head, port Itea. The eastern shore of the gulf, with the exception of port Sikia, an inlet open to the north-west, is without a break and clear of dangers; the western coast is irregular, with several islets, off-lying rocks, and shoals. Plan,  
221 [830].  
Lat.  $38^{\circ} 20'$  N.  
Long. 22 26 E.

The gulf is surrounded by high mountains culminating north-eastward in mount Parnassus, which rises 8,040 feet above the sea. Parnassus, in classic times the fabled haunt of the Muses, possesses, among other noted spots in its vicinity, the Castalian spring and the ruins of the temple of Delphi, on or near the site of which is now the town of Kastri. The severe earthquake of the 2nd August 1870 caused much destruction and distress in the mountain villages as well as along the coast in the vicinity of the bay.

**Cape Andromache**, the west point of the gulf, is a rounded and bold headland, the summit of which, 3 cables from the extremity, is 276 feet high. The cape is steep-to, and may be rounded as convenient. At  $1\frac{1}{4}$  miles north-eastward of cape Andromache is cape Trakilos, high and bold. Lat.  $38^{\circ} 20'$  N.  
Long. 22 22 E.

**Port Andromache**, situated immediately north of cape Trakilos, is about 5 cables in extent, with an inlet in the south-west part fit for small vessels. The port is deep throughout, there being 24 to 29 fathoms in the middle.

Andromache shoal lies 4 cables eastward of cape Trakilos, with  $1\frac{3}{4}$  fathoms least water, 5 and 6 fathoms around, and deep water without. Small vessels pass between it and the land, but large vessels should keep outside.

The east end of A. Demetrios island in line with west extreme of the spur of mount Kutsaros, N.  $21^{\circ}$  E., leads eastward of Andromache shoal.

**PORT GALAXIDI**, northward of port Andromache, is separated from it by a promontory projecting eastward. The port is a large bay, a mile in diameter, with depths of 15 to 18 fathoms in the centre, and is protected by a chain of islets and shoals extending north-eastward from the southern point. In the southern part of the bay are two creeks, one on either side of the town; the south-eastern creek named Portamichi harbour is generally full of coasting vessels. Plan,  
221 [830].  
Lat.  $38^{\circ} 23'$  N.  
Long. 22 23 E.

**The town** of Galaxidi, standing partly on the projection between the two creeks, contains about 4,600 inhabitants, who mostly lead a seafaring life or are employed in shipbuilding, for which the town is famed. There is regular weekly steam communication with other ports in the gulf, and telegraphic communication with Patras.

**Islets and channels**.—Of the islets and shoals protecting port Galaxidi on the east, there are four of the former, with passages between

Plan,  
221 [830].  
Lat. 38° 23' N.  
Long. 22 23 E.  
Var. 5 35 W.

them into the port. Apsiphia, 28 feet high, the southernmost islet, is a cable in length east and west; it lies 2 cables seaward from the southern point of the port. A. Giorgios or San Georges, 84 feet high, the second islet, is larger than the others, 2 cables in diameter, and is  $2\frac{1}{4}$  cables north of Apsiphia.

The channel between these two islets is the usual passage into the port and carries  $5\frac{1}{2}$  fathoms water, but nearly in the middle of the passage one cable south-west of A. Giorgios the depth is only  $4\frac{3}{4}$  fathoms.

The third islet A. Panagia, 21 feet high, is  $3\frac{1}{2}$  cables N.N.E. from A. Giorgios; midway between the two is a rocky shoal with less than one foot water. A. Demetrios, the fourth islet, is 27 feet high, about half a cable in diameter and 8 cables E.  $\frac{3}{4}$  S. from A. Panagia with shallow patches between them.

There is a deep channel  $1\frac{1}{2}$  cables wide between the reefs east of A. Panagia and A. Demetrios. Itea church dome in line with right extreme of Molimeino island, N.  $14^{\circ}$  E., leads through this channel.

**Shoals.**—A rocky patch with  $4\frac{3}{4}$  fathoms least water lies in the middle of the southern part of port Galaxidi, with Apsiphia islet lighthouse bearing S.  $36^{\circ}$  E., distant  $7\frac{1}{2}$  cables; and the north extreme of A. Panagia N.  $72^{\circ}$  E.

A head with a depth of  $4\frac{1}{4}$  fathoms on the northern extremity of the foul ground extending nearly 4 cables northward of A. Panagia, lies with the centre of A. Demetrios bearing S.  $58^{\circ}$  E., distant  $9\frac{1}{2}$  cables.

On the extremity of the foul ground stretching northward from A. Demetrios islet, there is a head covered with  $4\frac{3}{4}$  fathoms water, situated with the centre of A. Demetrios bearing S.  $10^{\circ}$  E., distant  $3\frac{3}{4}$  cables. The depth is  $4\frac{3}{4}$  fathoms one cable southward of this head, with from  $5\frac{1}{2}$  to 9 fathoms between.

A rocky patch with 3 fathoms least water, lies with the centre of Molimeino island bearing N.  $83^{\circ}$  E., distant  $1\frac{9}{10}$  cables.

**Harbour light.**—A small *fixed red* light is shown from a mast on the island of Apsiphia at an elevation of 50 feet above the sea, visible about 2 miles.

**Directions.**—Cape Andromache should have a fair berth in passing; then, in order to clear the Andromache shoal, the cape should not be brought southward of W. by S.  $\frac{1}{2}$  S. until A. Demetrios islet is open west of the western extreme of the spur of mount Kutsaros (N.  $21^{\circ}$  E.); with this mark, proceed northward and when past the shoal, if intending to enter by the southern channel steer for A. Giorgios islet and pass midway between it and Apsiphia, rounding Petalos rock about a cable distant on the port hand. Anchor off the town where convenient in a depth of 8 to 10 fathoms, mud, or in Glipha bay on the west side of Galaxidi in 8 to 13 fathoms, mud and fine sand. This channel is not available for a vessel of deep draught.

If intending to enter by the north channel after passing Andromache shoal, bring Itea church dome in line with the east extreme of Molimeino, N.  $14^{\circ}$  E., which will lead between A. Demetrios and A. Panagia, and after passing half a mile northward of A. Panagia round into the port and proceed to an anchorage.

The entrance northward of the islets is wide, but, as the water shoals northward of them, a large vessel should round A. Demetrios islet from the eastward at a distance of half a mile, fixing by cross bearings of the islets, and steer westward midway between it and the northern shore of the port until within the islets, and then steer for the anchorage in Glipha bay.

**PORT ITEA (Salona)**, situated in the northern part of the gulf of Salona, is about 8 cables in diameter, and 5 cables wide at the entrance between the low sandy point Marathia on the eastern side, and the western shore one mile north of Tripia point, the northern entrance point of port Galaxidi.

Plan,  
221 [830]  
Lat. 38° 26' N.  
Long. 22 24 E.  
Var. 5 30 W.

**Town.**—Along the beach east of Marathia point is the town of Itea, containing from 800 to 900 inhabitants. A shallow bank borders the beach fronting the village.

There are depths of 8 to 10 fathoms over the greater part of the port, and good holding ground. Eastward of the bluff point of Tripia, are the three small islets of Stafida, A. Konstantino, and Molimeino, with shallow rocky ground between and around them, but there is a passage for coasters between these islets and Tripia point.

Itea is the port for Salona, distant  $7\frac{1}{2}$  miles to the north-west. The town of Salona, ancient *Amphissa*, has a castle, and several well-built churches and manufactories; between it and the scala is a fertile plain covered with olive trees and bounded by high mountains.

**Pier.**—The pier at Itea is 150 yards in length, and has a depth of 8 to 10 feet at its end.

**Light.**—From an iron support, painted blue, on the pier head, a *fixed red* light is exhibited at an elevation of 20 feet above the sea, visible in clear weather from a distance of 5 miles.

**Directions.**—In proceeding for port Itea steer to the northward and pass half a mile eastward of A. Demetrios islet; when the islet bears S.S.W. do not bring it southward of that bearing, and steer N.N.E. until Stafida islet, the northern of the three off Tripia point, bears W. by N., or a cave on the hill-side on the western shore, opens out north of Stafida.

Then steer towards Marathia point and anchor northward of Stafida islet, nearly midway between it and the village of Itea, in a depth of 8 to 10 fathoms, sand and mud, with the centre of the village bearing about N. by E.

The bank abreast the town extends 2 cables from the shore and is steep-to.

If it be intended to enter port Itea, round Marathia point, avoiding the elbow of the shoal on its southern side, and anchor in 7 to 9 fathoms, about a third of a mile northward of the point, sheltered from all winds. It is excessively hot and sultry at this anchorage in the summer. There is a rise of tide at springs of about 2 feet.

Itea is in communication with other ports by means of Greek coasting steamers, which call here regularly.

**THE COAST.**—Cape Passalos, the eastern point of the gulf of Salona, is a bold promontory presenting a broad face seaward at the termination of the mountain range which separates this gulf from Aspra Spitia bay; the highest point of the range in the immediate neighbourhood is the summit of mount Xero Johannes, 2,799 feet high.

Chart,  
1,600 [828].  
Lat. 38° 17' N.  
Long. 21 33 E.

From the south-east extreme of cape Passalos the shore trends in a northerly direction  $2\frac{1}{2}$  miles to Trakilos point; at 6 cables E.S.E. from this point lies the bold rugged island Tsaruchi, 236 feet high and half a mile long north-west and south-east, with a deep channel clear of dangers between it and the mainland.

Plan of Aspra  
Spitia bay on  
463 [833].

From Trakilos point the shore recedes to the westward, forming a bay  $2\frac{1}{2}$  miles across between the point and mount Kephali. In the northern part of the bay there are three small inlets with deep water. The south-west part of the bay is known as Overesse bay, near the middle of which and 3 cables from the shore there is a rocky patch with  $4\frac{3}{4}$  fathoms least water.

About one mile N.E.  $\frac{1}{4}$  N. from Trakilos point lies Trakilos rock, upon which the depth is 5 fathoms.

Plan of Aspra  
Spitia bay on  
463 [833].  
Lat. 38° 20' N.  
Long. 22 38 E.  
Var. 5 30 W.

The bold promontory of mount Kephali, 1,136 feet high, is joined to the mainland by a low neck, the eastern face is bold and steep-to.

**Aspra Spitia bay**, the entrance to the inner part of which lies between mount Kephali and cape Munda, recedes here 2 miles to the northward with deep water throughout. The western part of this bay is known as Anti Kyrra bay, and affords a well-sheltered and good anchorage in depths of 13 to 16 fathoms, about  $2\frac{1}{2}$  cables from the surrounding shores.

The port and village of Aspra Spitia, ancient Anti Kyrra, on the north shore of the bay, is the scala or landing place for the town of Livadia in the interior; it carries on a considerable trade.

Local steam vessels call here two or three times a week, and there is telegraphic communication with Patras and Corinth from Distomi, a village under the slopes of mount Parnassus 4 miles to the northward.

**The coast** from cape Munda trends in a southerly direction  $2\frac{1}{2}$  miles, thence easterly  $5\frac{1}{2}$  miles to the head of Zalitza bay. Mount Tarsos, 2,354 feet high, rises abruptly from the sea  $1\frac{1}{2}$  miles east of cape Munda; from this mount a ridge extends parallel to the shore, rising gradually to Kiveri peak, 5,136 feet high, the western summit of mount Helicon,  $1\frac{1}{2}$  miles north of Zalitza bay.

At 2 miles south-east of cape Munda, and  $1\frac{1}{2}$  cables from the shore, lies a small steep islet named Kassidis, 76 feet high; one mile further south there are two islets, little over half a mile apart east and west.

Ambelos, the eastern of the two, lies about three-quarters of a mile from the coast, it is about a quarter of a mile long north and south, steep, and cliffy, and rises to a peak at its southern end 202 feet high. Daskalio, the western islet, is 86 feet high, 200 yards in diameter, with precipitous cliffy sides except on the north; both these islets are surrounded by deep water and are steep-to.

From the head of Zalitza bay the shore trends south-west  $2\frac{1}{2}$  miles to cape Velanidia, the summit of which is 316 feet high.

**Zalitza bay** is  $2\frac{1}{2}$  miles deep in an easterly direction and nearly the same distance across at the entrance; about a quarter of a mile from the northern shore of the entrance is a rocky shoal with 6 feet water; elsewhere there are no dangers.

**Port Sarandi.**—Tamburlo point is  $7\frac{1}{2}$  miles south-eastward of cape Velanidia; the coast on the western side of the point trends almost due North for  $3\frac{1}{2}$  miles, and meeting the high land trending eastward from cape Velanidia, forms a bight named port Sarandi, open to the southward, at its head; the port is more than a mile deep with a sandy beach at its head, and is about 6 cables wide. The depth in the middle of the inlet is great; and at a quarter of a mile from the head is from 17 to 20 fathoms.

Tamburlo point projects to the southward, and off it are two small islets; the smaller about 2 cables southward of the point, and Vromo, the larger, a mile westward of the point.

See caution on chart.

**Mount Helicon.**—**Aspect.**—This celebrated mountain extends eastward and westward along this part of the coast from near the entrance to Aspra Spitia bay, where mount Verseniko, its western shoulder, rises from the sea to the height of 2,330 feet; at  $4\frac{1}{2}$  miles farther eastward is Kiveri peak, only  $1\frac{1}{2}$  miles inland from the head of Zalitza bay; and 3 miles farther eastward, Palaevuna peak, 5,740 feet high and its highest point, is  $3\frac{1}{2}$  miles northward of the head of port Sarandi.

**Dobrena bay.**—This magnificent bay is  $5\frac{1}{2}$  miles in length east and west, and from about one to  $1\frac{1}{2}$  miles in width. In the middle, near the north shore, is Kuveli islet, about 3 cables in length north and south. The

Lat. 38° 21' N.  
Long. 22 40 E.

Plan of Zalitza  
bay on  
463 [833].  
Lat. 38° 16' N.  
Long. 22 46 E.

Chart,  
1,600 [828].  
Lat. 38° 14' N.  
Long. 22 53 E.

Lat. 38° 11' N.  
Long. 22 54 E.

shores of the bay are rocky and irregular, the water is generally deep, and there are no known hidden dangers. Chart,  
1,800 [828].  
Var. 5° 25' W.

Within the bay are three inner bays or ports, viz., port Vathy at the western end, port Lusa on the northern side, and port Aliki at the eastern end. The entrance is from the south, and is fronted by Phonia, Grombolura, and Makro, three islands which make an almost land-locked basin of the interior; the largest island, Makro, is the most eastern.

The western passage into the bay is the best; it is about 2 miles eastward of Tamburlo point, and all the islands should be left on the starboard hand on entering.

Mount Korombili, of conical form and 2,670 feet high, rises over the eastern part of the bay and serves as a good guide. Lat. 38° 12' N.  
Long. 23 4 E.

**Livadostro bay.**—This bay, at the head or eastern end of the gulf of Corinth, is about 7 miles wide at the entrance between Tamburlo point on the north and cape Olmiæ on the south; from thence it extends eastward 13 miles. The Kala islands, presently described in detail, lie nearly in the middle of the entrance, 3 miles southward of the entrance to Dobrena bay, but are steep-to and not of much importance except for the space they occupy. Eastward of Dobrena bay is port Livadostro, an inlet 2 miles wide at the entrance; on its western side, the coast rises almost perpendicularly from the sea to the high land of mount Korombili. Mount Elatia, ancient *Kithæron*, 4,680 feet high, rises north-eastward of the port of Ghermanó, ancient *Ægosthena*, the next bay eastward, which is open to the west; the low shore at its head is the eastern extreme of the gulf of Corinth. Lat. 38° 7' N.  
Long. 23 5 E.

The southern shore of Livadostro bay is the base of a chain of mountains of which the greatest height is mount Geraneia, 4,494 high feet. The peak of Melangavi, about 6½ miles westward of mount Geraneia, is remarkable, rising 3,445 feet above the sea from the low land of the isthmus of Corinth, and is a good guide for the bay of Corinth.

**The Kala islands** are the four islets Kala, Daskalio, Praso, and Prasophillo; they occupy a space 1½ miles in extent north-west and south-east by a width of one mile, and lie nearly in the middle of the entrance of Livadostro bay as just described. Lat. 38° 7' N.  
Long. 22 59 E.

Kala, the largest and eastern islet, 244 feet high, rises in two hills and is connected by a shallow sandy neck with Daskalio, the north-western islet, which has one hill. Praso and Prasophillo, the other two islets, lower and smaller, are also connected by shallow water, and lie 2 or 3 cables south-westward of and nearly parallel with the two larger islets. A 2-fathom spit extending 2 cables south-eastward from Praso, the larger of the two south-western islets, leaves, between it and the coast bank of Kala, a deep passage about a cable wide to a limited anchorage within, in a depth of 18 fathoms; the entrance from the north-west is wider. The ruined convent of San Nikolo is on the western side of Kala. These islets being surrounded by the high land of the gulf appear lower than they really are.

**CORINTH BAY** is the deep bight southward of the promontory of Melangavi, which terminates in the cape of that name, and which promontory separates the bay of Corinth from that of Livadostro. The bay of Corinth is 4½ miles wide between cape Melangavi and the southern shore, and extends nearly 7 miles south-eastward to the shore of the isthmus of Corinth at its head, where the Corinth canal connects the gulf of Corinth with the gulf of Athens. The southern shore is low and partly Plan of  
Corinth bay,  
1,367 [831].

Plan of Corinth  
bay and isthmus,  
1,367 [831].  
Var. 5° 25' W.

Lat. 38° 2' N.  
Long. 22 50 E.

cultivated, but at a short distance inland it rises to the high land of the Morea. There are no dangers, and the water is everywhere deep at a prudent distance from the shore.

**LIGHT.**—On cape Melangavi stands a square masonry light-tower and dwelling, 41 feet high, from which, at an elevation of 192 feet above the sea, a *flashing white* light is exhibited, with a period of *ten seconds*, as follows :—Flash, *four seconds*; eclipse, *six seconds*. The light is visible in clear weather from a distance of 20 miles. Reported irregular, 1908.

**THE ISTHMUS OF CORINTH** is from 180 to 270 feet above the sea, and the distance across by the canal is  $3\frac{1}{2}$  miles. On the north-east is the high land of mount Geraneia, and opposite, on the southern side, the mountains of the Morea.

**Ancient Corinth.**—At  $1\frac{1}{2}$  miles from the shore on the southern side of Corinth bay and  $4\frac{1}{2}$  miles westward of the Canal, are the ruins of the ancient city of Corinth; traces of its walls are still to be seen, and a few Doric columns, the relics of a temple, are the principal and most interesting monuments of antiquity still existing.

These remains are at the northern foot of the Acro-Corinthus or Acropolis, whose ruins crown a steep and isolated rocky height 1,941 feet above the sea; within its walls there is nothing of special interest, but, from it, the eye is gratified by an extensive and magnificent prospect.

**Corinth**, on the south-eastern shore of Corinth bay, and about  $1\frac{1}{2}$  miles westward of the entrance to Corinth canal, has rapidly increased in size since the opening of the canal, and has regular steam communication with the Adriatic, Ionian islands, &c., and by a good road across the isthmus (ferry across canal at Isthmia) to Kalamaki, and from thence by steamer, with Athens, Constantinople, &c. It is on the railway from Athens to Patras and Pyrgos and also to Nauplia, and is in ready communication with the general telegraphic system of the continent.

**Mole.—Light.—Anchorage.**—A mole about 100 yards in length extends from the rocks off Lewis point, north extreme of the town; it serves as a screen to the landing pier within it.

A *fixed red* light is shown from the outer end of the mole when the Greek passage steamer is expected.

Half a mile eastward of the mole, in fine weather, there is anchorage in a depth of 15 to 18 fathoms, but small craft may anchor nearer the town.

A better anchorage with north-westerly winds is at Lutraki in the north-eastern part of the bay at the foot of the peak of Melangavi, but a vessel anchoring here will be rather close in-shore, the water being deep.

**The Telegraph cable** from Patras is landed about 3 cables north-eastward of the canal entrance, and another cable is laid from the southern coast of the isthmus to Athens.

**CORINTH CANAL** follows almost exactly the line of the canal commenced, but never completed, by the emperor Nero 1,800 years ago. The canal was commenced in 1882 and opened by the King of Greece on the 6th August 1893.

**Dimensions.—Depths.**—The canal is straight in a north-west and south-east direction, and is 3 statute miles 1,610 yards in length. The north-western portion of the canal for a distance of 1,280 yards, and the south-eastern part for a distance of 933 yards, were dredged, and are 98 feet wide at the water line, 72 feet at the bottom, with a depth of

Plans,  
2,021 [832].  
1,367 [831].  
Lat. 37° 57' N.  
Long. 22 57 E.

25½ feet. The remainder is a cutting through the land (the summit of which was 250 feet above the level of the sea) and is faced with masonry; it is nearly 81 feet wide at the water line, 69 feet at the bottom, and has a depth of about 26½ feet.

Plans,  
1,367 [831],  
2,021 [832],  
Lat. 37° 57' N.  
Long. 22° 57' E.  
Var. 5 25 W

The railway from Athens to Corinth and Patras crosses the canal by a bridge, the height of which from the water to the lower surface of the principal beams is 147½ feet.

The canal is available for vessels whose draught does not exceed 23½ feet, and whose breadth is not more than 65½ feet.

The Orient s.s. *Lusitania*, length 380 feet, breadth 41 feet, and a tonnage of 3,877 tons, has passed through the canal.

Her late Majesty's yacht *Osborne*, with an extreme beam of 64 feet 2 inches, passed through on the night of 2nd May 1899, under her own steam, a tug also towing ahead. H.M.S. *Tyne*, 3,560 tons, passed through on 18th February 1905, under similar conditions, and without a pilot.

Pilots are recommended for large ships; also a tug astern as well as ahead. The tugs are of small power; they are supplied free of charge to vessels of and above 800 tons.

**Moles.**—The entrance to the canal on the Corinth side is protected by two moles, forming the port of Poseidonia, the heads approaching one another, and leaving a passage 80 yards wide.

The south-eastern entrance, in Kalamaki bay (vol. IV.), is protected by a single breakwater curving from the shore north-east of it.

Bollards are placed along the sides of the canal, about 110 yards apart, to assist vessels keeping in the middle of the canal.

The towns, Poseidonia at the north-western end, and Isthmia at the south-eastern end, were founded in connection with the canal.

**Lights.**—The north-east molehead at Poseidonia, Corinth entrance, is marked by a *fixed red* light, and the south-west molehead by a *fixed green* light.

The molehead at Isthmia, south-east end of the canal, is marked by a *fixed green* light; on the opposite or west point of the entrance to the canal a *fixed red* light is shown, visible 3 miles.

In addition to these, there are 56 *white* electric lights arranged in pairs, one on either side of the canal.

**Telegraph.**—The telegraph follows the side of the canal.

**Tide.**—It is high water, full and change, approximately at 5h. In the absence of wind springs rise 10 inches, neaps are irregular.

**Current.**—The movement of the water in the canal is dependent entirely on the wind, and its effect in holding up the water either in Corinth or Kalamaki bay. The general rate of the stream is 1½ knots, and seldom exceeds 2 knots. There is a range of 5 feet in the level of the sea at Poseidonia, and of 3 feet at Isthmia. Sometimes a set across the entrance at Poseidonia is experienced.

**Directions.**—The best time to navigate the canal, especially with large vessels, is when the stream is adverse, as they will be more under command. Vessels cannot pass one another in the canal, there being no sidings.

A signal can be made by pre-arrangement when the current is most favourable—that is, contrary—but the authorities do not consider there is any necessity to wait, though they recommend large vessels in any case to employ tugs.

Plans, 1,367 [831],  
 2,021 [832].  
 Lat. 37° 57' N.  
 Long. 22 57 E.  
 Var. 5 25 W.

In entering the canal from the gulf of Corinth, vessels should be prepared for an occasional slight current setting to the north-east.

**Provisional Regulations for navigating the canal.\***—Masters of vessels should conform to the regulations, obey all signals mentioned therein, and comply with any requisition made to them to execute the regulations. A copy of the regulations will be supplied to them on demand.

The transit through the Corinth canal is open to vessels of all nationalities, provided their draught of water does not exceed  $23\frac{1}{2}$  feet, and that they are of not more than  $65\frac{1}{2}$  feet beam.

Sailing vessels of 4 tons or more must be towed through. Steam-vessels may pass through the canal under their own steam, or be towed.

The canal authorities are not compelled to tow steam-vessels, but if there are tugs unengaged it will be done.

The speed of vessels must not exceed 6 miles an hour.

Masters of vessels passing through the canal must pay all dues for passage at the entrance, and when necessary those for towage and pilotage. They must also give the following information in writing:—

Description of the vessel. Name and nationality of the vessel.

Name of the master. Name and address of the owners.

Port of sailing. Port of destination. Draught of water.

Number of passengers, to be ascertained from the passage list.

Number of the crew. Tonnage and nature of the cargo.

Net tonnage, to be ascertained by the vessel's official papers, and the rules of the International Tonnage Commission, held at Constantinople in 1873.

The canal authorities determine the time of departure and the stoppages of each vessel. No vessel can enter the canal unless the permission of the Captain of the Port has been received.

By day a blue flag, and by night a *white* light, signify that the passage is clear.

A red flag, or *two white* lights signify that the passage is not clear, and entry is prohibited.

All vessels, preparatory to entering the canal, must have their yards braced up and their boats swung inboard. In addition to two bow anchors, a kedge with a hawser bent to it strong enough to hold the vessel, must be carried at the stern, ready for letting go.

Vessels navigating the canal by night must carry, in addition to the regular lights, a *white* stern light. When towed, only the vessel being towed carries the light, and if more than one vessel is towed, only the last vessel carries the stern light.

In the event of grounding the canal authorities shall have the right to direct all operations for floating the vessel, and if necessary to unload and tow her at the expense of the vessel. The cost of floating, towing, discharging, and reloading must be paid before the departure of the ship.

The following actions are prohibited in the canal:—

Anchoring a vessel, except under unavoidable circumstances.

Throwing overboard cinders, ashes, or material of any kind.

Firing guns on board vessels.

All vessels must furnish their own warps, and those being towed must use their own propelling power, or have it in readiness to assist the tug. Vessels can be towed by tugs not belonging to the Canal Society, but such tugs must pay the dues to which ordinary vessels passing through the canal are subject; except when going through the canal to meet

\* These regulations are liable to alteration, and a copy should therefore always be obtained from the local authorities.

vessels of their owner, which they intend towing, or when returning to their usual berths after having towed a vessel through.

Chart,  
1,600 [828].  
Var. 5° 35' W.

Payment is made on the net register tonnage (Suez canal certificate), and is collected at either end. Isthmia is the principal station, and has a health-office, custom-house, post and telegraph offices.

**SOUTHERN SHORE.**—General remarks.—From the head of the bay of Corinth, the coast of the Morea westward as far as Vostitza, about 45 miles, has only open roadsteads where, during fine weather, coasting vessels collect the produce of the country at the different scalas or landing places. The whole of this district is well populated, nearly all the inhabitants are employed in the cultivation of currants, for which it is famous. The coast everywhere is clear of danger and may be approached at discretion. Amongst the different grand and arid mountains of the Morea, mount Zyria, ancient *Cyllene*, rises 7,800 feet above the sea, about 12 miles inland. Several mountain torrents discharge themselves into the gulf but do not merit any particular mention.

The Athens and Patras railway follows the coast-line, generally at a short distance inland.

**Landmark.**—Avgo peak.—A special object of recognition on this coast is the white conical peak of Avgo, which rises to a height of 562 feet close to the shore about 24 miles westward of the entrance to the Corinth canal; it is seen from all parts of the gulf and is an excellent mark.

Lat. 38° 8' N.  
Long. 22 29 E.

**Akrata point**, about 8 miles westward of Avgo peak, is low and formed of the alluvium from the river Krathis; the shore between consists of a narrow strip of flat cultivated land at the foot of the mountains, with a shingly beach which is steep-to throughout. A mile west of Akrata point the shore is steep and cliffy, with the exception of the low alluvial points of Engali bay about 6 miles further west.

**VOSTITZA BAY** is semicircular, open to the northward, 2 miles wide between points Gyphlissa and Mirlia at the entrance, and recedes nearly a mile from that line. The water is very deep until within half a mile of the head of the bay, when it shoals from 25 to 10 fathoms close in.

Plan of Vostitza  
bay on 463 [833].  
Lat. 38° 16' N.  
Long. 22 5 E.

The town of Vostitza which by law is restored to its ancient name *Ægion*, stands on a steep flat hill in the southern part of the bay, about 50 feet above the sea, and contains about 8,000 inhabitants. It is a place of considerable importance with a thriving trade.

**Mole.**—A mole extends sufficiently far from the shore, about the middle of the bay, to admit of steamers for cargo anchoring westward of it and mooring with stern hawsers to it; there is a stone quay along the shore below the cliff.

**Supplies.**—Small supplies may be had and good water is obtained from a fountain on the quay. Currents are shipped here in great quantities during the season.

**Communication.**—Vostitza is in regular communication by rail with Patras and Pyrgos westward, and with Corinth, Athens, and Nauplia eastward, and by steamers and electric telegraph with these and other ports.

**Light.**—From a metal column and shed on the molehead, at an elevation of 27 feet above the sea, a *fixed red* light is exhibited, visible in clear weather from a distance of 5 miles.

Plan on  
427 [829].  
Chart,  
1,600 [828].  
Lat. 38° 15' N.  
Long. 22 4 E.  
Var. 5 55 W.

**Directions.—Anchorage.**—Vessels from the westward bound for Vostitza should keep in the middle of the gulf until near Trisonia island, and then steer south-eastward for the town, which, when first seen, appears as two, the lower part being separated by the brow of the hill from the higher. The points of the bay should not be rounded too closely, as the shore all round is flat, low, and sandy.

Plan,  
463 [863].

Merchant vessels anchor off the western angle of the town, 2 cables from the shore, in a depth of about 15 fathoms, mud, and good holding ground; or, as before explained, moor with their sterns to the mole on its western side. Vessels of war anchor a little farther out. The anchorage is sheltered from the prevailing winds which blow strongly up or down the gulf, especially those from the eastward during the winter months.

Approaching from the eastward, cape Psaromyta, on the northern shore of the gulf and nearly 5 miles north-eastward of Vostitza, indicates its position.

Chart,  
1,600 [828].

**COAST.**—About 4 miles north-westward of Vostitza bay is cape Salmeniko, low and projecting, with the rivulet of the same name running into the sea on its western side; westward of the point is cape Lambiri, at the foot of mount Lubista, 2,440 feet high at only  $1\frac{1}{2}$  miles from the shore; then follows, about 5 miles farther westward, Drepano point, described at page 347.

This part of the coast offers nothing worthy of remark.

## WESTERN COAST of the MOREA.

Charts,  
1,676 [826],  
207 [834].  
\*Lat. 38° 13' N.  
Long. 21 22 E.

**General remarks.—Aspect.**—The description of the gulf of Patras and Corinth having been given in the preceding pages, the description of the western coast of the Morea from cape Papas\* (see page 343), now follows. The land immediately southward of that cape rises in rounded dark hills; Mavro Vuno, the highest, 808 feet above the sea and 3 miles from the cape, falls suddenly towards the plain on the south, from whence a low sandy beach fronting the densely-wooded low land, extends southward  $3\frac{1}{2}$  miles to Kunupelli point, a rocky isolated height, 200 feet above the sea, and about half a mile in extent, with the ruins of a tower on its north-eastern part.

From Kunupelli point, the low sandy shore, wooded and cultivated within, continues south-westward to cape Glarenza, a distance of  $13\frac{1}{2}$  miles. Kotiki lake, close to the sea and nearly midway between the point and cape, is about  $2\frac{1}{4}$  miles in length, with brackish water, and contains abundance of fish; it communicates with the sea by a narrow outlet. At 2 miles south-westward of Kotiki lake is the smaller lake Aliki, and south-eastward of the latter is the populous village of Lekhena, containing upwards of 600 houses.

**Patches.**—North-westward of Kotiki lake, and nearly 2 miles from the shore, there is a 7-fathoms rocky patch; and off the southern end of the lake,  $1\frac{1}{2}$  miles from the shore, is a 5-fathoms patch.

**Cape Glarenza**, ancient *Kyllini*, is a rocky projection with a large rock above water off its northern extreme, and with rocky ground extending more than  $1\frac{1}{2}$  cables outside the rock, along the north-western face of the cape, and around Kaufkalida islet, which latter is about a mile westward of the rock off cape Glarenza. In rounding the cape from the westward for the anchorage off the village of Glarenza it should be given a wide berth.

Chart,  
207 [834].  
Lat. 37° 57' N.  
Long. 21 8 E.

**Mole.—Anchorage.**—On the inner side of cape Glarenza, the shore is a bay open to the northward, and at the western part of it is the village of Glarenza, with a custom-house. Chart,  
207 [834].  
Var. 5° 55' W.

The mole is about 750 yards in length, curving from north-east to south-east. About half a mile off the village is excellent summer anchorage in depths of 5 or 6 fathoms, sand and mud; coasters anchor closer in. Greek steamers call here regularly.

The produce of the richly cultivated land in the neighbourhood is principally shipped from here for Zante.

North-westward of the village and near the extreme of cape Glarenza, are the ruins of ancient *Cyllene*, consisting of a tower, tombs, fragments of walls, the remains of an ancient mole and port.

**Light.**—On the western angle of the mole at Glarenza, about 225 yards from its inner end, is an iron pillar from which is exhibited, at an elevation of 39 feet above the sea, a *fixed white* light, visible in clear weather from a distance of 8 miles.

**Kaufkalida islet**, 18 feet high and rather more than a cable in diameter, lies about 3 cables off the extreme point just westward of cape Glarenza, and is almost connected with the mainland by a reef of rocks awash; a little eastward of the islet is a large rock above water. There are some Hellenic remains on the islet, and pasturage for a few goats. The edge of the shore bank in 5 fathoms is about a quarter of a mile outside the islet.

**LIGHT.**—On Kaufkalida islet from a square masonry tower, with dwelling attached, 49 feet high, an *occulting* light is exhibited at an elevation of 64 feet above the sea, showing *white* when bearing from N. 22° E. to N. 72° E.; *red* from N. 72° E. to East, over Montague rocks; *white* from East, through south, to S. 37° W. The *white* light is visible in clear weather from a distance of 14 miles, *red* light at 9 miles.

**Kastro Tornese.**—From the western point of cape Glarenza, the coast trends southward for 6 miles to cape Trepito; it is cliffy, with sandy beach and bordered by a bank extending nearly half a mile off-shore. It is backed by high land, and about midway is a remarkable hill on which is the castle of Tornese, ancient *Chelonites*, 857 feet above the sea and a most conspicuous object. At the foot of the castle is the little village of Klemutzi, and inland are the cultivated and wooded plains of Elis.

**The Montague rocks**, described at page 338, lie 6 miles westward of Kaufkalida lighthouse. These rocks are covered by the *red* sector of Kaufkalida light as before stated. Lat. 37° 55' N.  
Long. 21 0 E.

Sailing vessels bound to Patras from Zante, usually stand across towards Kastro Tornese until within 3 miles of the shore, and then steer to the northward. With southerly winds the current is strong in the vicinity of the rocks, and also between them and the Tornese shore.

**Cape Trepito** is cliffy on its western side, but the shore is sandy between it and Glossa point which is again formed by cliffs, a long mile eastward of cape Trepito. At 1½ miles northward of the cape, a small stream runs into the sea, near which at a short distance inland are petroleum springs. Lat. 37° 51' N.  
Long. 21 7 E.

**Telegraph cable.**—A telegraph cable from Zante is landed at cape Trepito.

**THE COAST** from cape Trepito trends in a south-easterly and southerly direction 15½ miles to cape Katakolo, with a low sandy shore;

Chart,  
207 [804].  
Var. 5° 55' W.

the cultivated interior is the continuation of the plains of Elis. During fine summer weather vessels may anchor anywhere in this bay in depths of from 9 to 12 fathoms, sand.

The river Gastuni, ancient *Peneus*, runs into the sea about 6 miles south-eastward of cape Trepito and is sufficiently deep for large boats to ascend several miles.

**Rocks.**—At Paluki point, 4 miles south-eastward of the mouth of the Gastuni, rocks extend half a mile off-shore and are here and there scattered along the coast to the southward until within a mile of cape Katakolo, therefore this part of the shore should not be approached nearer than a mile.

The monastery of Skaphidia, standing on the foundation of an ancient Venetian fortress 370 feet above the sea and 4 miles northward of cape Katakolo, is inhabited by monks, and is a conspicuous object. Pondiko Kastro, the ruins of an ancient fortress 284 feet high and 2 miles northward of cape Katakolo, is also remarkable and a guide to Katakolo bay. A few miles inland are mounts Muria and Kremasti, 931 and 1,165 feet high respectively.

Lat. 37° 42' N.  
Long. 21 19 E.

Plan of Katakolo  
bay on chart,  
207 [804].  
Lat. 37° 38' N.  
Long. 21 19 E.

**CAPE KATAKOLO** is the low extreme of a tongue of land projecting nearly 2 miles southward. The coast westward and northward of the cape is irregular and bordered by rocky shoals, and by the two little islets Koraka and Tigani. The eastern or inshore side of the cape is also bordered by rocky shoals, and a sandy spit with only 2 fathoms water extends 3 cables from the cape; therefore, in rounding the cape, it should have a berth of half a mile or more.

**LIGHT.**—On the slope of the ridge, 780 yards within the extreme of cape Katakolo, is an octagonal lighthouse of gray stone, 29 feet high, from which is exhibited, at an elevation of 149 feet above the sea, a *fixed and flashing white light with a period of forty-six seconds*, showing thus:—*Fixed faint light, thirty-four and a half seconds; eclipse, three and a half seconds; bright flash, four seconds; eclipse, four seconds.* The light is visible in clear weather from a distance of 17 miles.

A telegraph cable from Zante is landed on the western coast of the peninsula of Katakolo, about 8 or 9 cables northward of the cape.

**KATAKOLO BAY.**—Between the peninsula of cape Katakolo and the coast eastward of it is a semicircular bay with a sandy beach at its head; it is quite sheltered from the westward but is exposed to southerly winds which send in a heavy sea.

**Mole.**—About 8 cables north-eastward of the cape, a mole projects about 3 cables eastward, and then 2½ cables north-eastward; it is 39 feet wide at the sea level and 20 feet above water; the depth at the head and along the inner side of the outer arm is 33 feet. The mole affords excellent shelter from southerly winds in 4 to 5½ fathoms; the bottom inshore towards the custom-house is rocky and the water shallow.

There is anchorage all over the bay, and the water shoals gradually towards the beach at its head, but rather suddenly towards the village.

**Light.**—A *fixed red light*, elevated 30 feet above the sea, is exhibited from the molehead at Katakolo.

**Village.**—Northward of the mole, in a small bend in the shore, is the thriving and improving village of Katakolo and the custom-house.

**Communication.**—Katakolo is a telegraph station and is in direct railway communication with Patras and Athens, *viâ* Pyrgos; it is also in steam communication with other ports, and during the fruit season, several

large steamers load with currants, raisins, and wine, the produce of the plains of Pyrgos. Water is scarce, there being but one well at the head of the bay near the commencement of the long sandy beach.

Chart,  
207 [804].  
Var. 5° 55' W.

**Pyrgos.**—The town of Pyrgos, situated on a hill 7 miles eastward of cape Katakolo, contains 5,000 inhabitants, is a telegraph station, and can be reached from Katakolo by a good carriage road as well as by railway. The surrounding plains are richly cultivated, but, near the sea, the malaria arising from the lakes causes ague and fever to be prevalent in the summer months.

Lat. 37° 40' N.  
Long. 21 27 E.

**GULF OF ARCADIA**, ancient *Kyparissia*. This so-called gulf is in reality only the bay included between cape Katakolo and cape Kunello, distant 31 miles south-south-eastward from it; and, from this line it recedes about 10 miles. The shore nearly the whole length of the gulf is low, sandy, and backed by high mountainous land. A little within the beach in the north-eastern part of Katakolo bay is lake Muria,  $2\frac{1}{2}$  miles in length.

South-eastward of lake Muria, and nearly 7 miles east-south-east from cape Katakolo, is the mouth of the river Ruphea, ancient *Alpheus*, one of the largest streams in the Morea, which boats, drawing from 3 to 4 feet water, ascend between 3 and 4 miles. Vessels anchor off the river in the summer months and load with timber for shipbuilding, which is floated down the stream.

The coast from the mouth of the Ruphea, until within  $3\frac{1}{2}$  miles of the town of Kyparissia, is a clean sandy beach with several streams running into the sea. At  $1\frac{1}{2}$  miles from the Ruphea, the chain of lakes extending along just inside the coast-line recommences with lakes Agulinitza or Ruphea, and Kaiffa; the former is 7 miles in length, the latter  $2\frac{1}{2}$  miles, and the whole extent of the lakes is nearly 16 miles. These lakes abound in fish, and are separated from the sea by a narrow slip of sand covered with trees, principally with pines. A mile inland from lake Kaiffa is the mountain of that name, 2,445 feet high and easily distinguished.

Lat. 37° 32' N.  
Long. 21 39 E.

**Water.**—During fine summer weather vessels may anchor off the mouth of the Ruphea about  $1\frac{1}{2}$  miles from the shore; water may be obtained here by leading long hoses into boats, the supply depending on the number of boats employed. With sea winds a swell sets in. The southern side of the entrance to the river where the beach is steep, is the best position.

**Kyparissia.**—The town of Kyparissia, commonly known as Arcadia, is erected on the site of the ancient city about half a mile from the beach, on an elevated spur of mount Psykro, which, about 3 miles inland, rises 4,156 feet above the sea. The town is at the foot of the ancient Acropolis, contains about 5,000 inhabitants, and is conspicuous from seaward.

Lat. 37° 15' N.  
Long. 21 41 E.

During the summer months, coasting vessels anchor off the town in a depth of about 15 fathoms and load with grain; but the roadstead is exposed to the prevailing north-westerly winds which send in a heavy sea. A small inlet open to the northward, with a mole projecting from its western point, affords shelter for small craft.

**The Coast** from Kamariki, about  $3\frac{1}{2}$  miles northward of Kyparissia, becomes rocky, with a few sandy bays at the outlets of mountain streams, and curves round in a south-westerly direction about 11 miles to cape Kunello, the southern limit of the gulf of Arcadia; from the southward, the land at this part appears to slope gradually down to a low point.

Chart,  
207 [804].  
Var. 5° 55' W.

Mount Morena, a little southward of and  $2\frac{1}{2}$  miles within the cape, is an isolated conical hill 1,250 feet high and easily recognised.

Between cape Kunello and Marathon point, about  $6\frac{1}{2}$  miles farther southward, the coast is rocky but clear of danger, with two or three streams running into the sea. A well cultivated plain, with extensive olive plantations and several villages, extends inland to the foot of the high rugged range of mount Agia which rises 3,957 feet above the sea and trends parallel with the coast.

During summer, small country vessels anchor off the bights in the coast to collect the produce.

Plan of Proti  
channel on  
207 [804].  
Lat. 37° 3' N.  
Long. 21 33 E.

**PROTI ISLAND**, ancient *Prote*, is 2 miles in length north and south, the northern part is one mile in breadth and 605 feet high, with a cliffy ridge around its upper part, except on the north-western side, the southern part averages about a quarter of a mile across for a distance of one mile. From the southward the island appears round, but, from the westward, the north end is high and round and the south end low. The island is wooded, covered with brushwood, rocky, steep-to, and separated from Marathon point by a channel 6 cables wide.

**Proti channel**.—The village of Marathopolis, erected since 1860, stands on the low rocky point of Marathon; from the point, a sandy spit extends 2 cables in a westerly direction with  $4\frac{1}{2}$  fathoms water on its edge, leaving a passage about the same breadth between it and a 5-fathoms rocky shoal, a quarter of a mile off the north-eastern part of the island, known as Proti channel; elsewhere in the channel the depth is from 6 to 10 fathoms.

During summer, coasting vessels usually anchor south westward of the village in 7 fathoms water to load with currants, the principal produce of the district. During south-westerly gales, a heavy sea runs through the channel.

Plan,  
211 [886].  
Lat. 36° 57' N.  
Long. 21 40 E.

**COAST**.—**Sikia channel**.—At 7 miles southward of Proti island is the Sikia channel, the northern passage into Navarin bay and the narrow cutting separating the northern end of Sphaghia island from the mainland; the coast between Proti island and this channel is low, rocky with sandy bays, and bordered by shallow water, with cultivated plains inland.

The Sikia channel, in ancient times a useful passage, was choked with sunken vessels and stones in 1571, to protect the Turkish galleys which had escaped from the battle of Lepanto, and has only 2 feet water at its inner end.

**Paleo Avarino**.—On a conical hill half a mile northward of the channel is Paleo Avarino, ancient *Pylos*, the remains of a large castle 450 feet above the sea, having on its northern and eastern sides perpendicular cliffs; it was once the residence of Nestor, and in the face of the cliff on the northern side is a large cave which bears his name.

**Port Voithio Kilia**.—Beneath the castle on the north is port Voithio Kilia, a small circular inlet used only by fishing-boats; it is silting up with sand. The port is separated from the extensive marsh Dagh Liani, on the east, by a narrow neck of sand.

Plan of  
Navarin bay,  
211 [836].  
Lat. 36° 56' N.  
Long. 21 40 E.

**SPHAGHIA ISLAND**.—**Kumatodes reef**.—Sphaghia island, ancient *Sphacteria*, is nearly  $2\frac{1}{2}$  miles long north and south and from 3 to 5 cables in width. Mount Elias, at its northern end, is 514 feet in height, and there are several smaller peaks on the southern part.

the highest being 327 feet. The eastern coast is high and steep to throughout; the western coast is also high, and towards the southern end is composed of steep whitish cliffs; its central part is irregular with rocky projections and is everywhere bordered by rocks.

Plan of  
Navarin bay,  
211 [836].  
Var. 5° 55' W.

At 9 cables southward of Tapho point, the north-western extreme of the island, and about  $1\frac{1}{2}$  cables from the shore, is the Kumatodes reef with 3 fathoms water.

**Pylos islet.**—A quarter of a mile from the southern end of Sphaghia is the rocky islet of Pylos, 114 feet high, with two smaller islets on its northern side; between the latter and the broken rocks close in-shore at the southern end of Sphaghia is a narrow but deep channel into Navarin bay, which, with a commanding breeze or under steam, may be used by moderate sized vessels with due caution, but the main channel is recommended. One of the Pylos islets is perforated, the hole appearing like a triumphal arch.

Lat. 36° 54' N.  
Long. 21 41 E.

**LIGHT.**—On the south-eastern side of Pylos islet, at the northern side of entrance to Navarin bay, is a stone lighthouse from which a *fixed red* light is exhibited, at an elevation of 116 feet above the sea, visible in clear weather from a distance of 6 miles.

**NAVARIN BAY.**—This extensive bay is covered by the island of Sphaghia, and is thus completely sheltered from westerly winds and sea; it is the most capacious harbour in the Morea.

Lat. 36° 56' N.  
Long. 21 42 E.

The entrance lies between Pylos islet and the mainland, and is about three-quarters of a mile wide, with depths of 30 to 35 fathoms in the fairway. A patch of  $4\frac{1}{2}$  fathoms lies a quarter of a mile off the southern shore, half a mile S.E.  $\frac{1}{4}$  S. of Pylos lighthouse, reducing the width of the entrance available for vessels of deep draught to that distance. After a continuation of northerly winds, a current sets out of the harbour, which, with baffling winds, at times renders it difficult of access to sailing vessels.

Within, the bay opens out to 2 miles in breadth, general depth varying from 15 to 25 fathoms, but in the northern part is the Sphaghia shoal of 3 fathoms, and Kuloneski islet. The eastern shore of the bay for some distance within the entrance is rocky, bordered by shallow water, and should not be approached too closely nor within a depth of 10 fathoms, as it then shoals suddenly; near the town are patches of  $2\frac{1}{2}$  and 3 fathoms at 2 and  $2\frac{1}{2}$  cables from the shore.

The eastern shore of Sphaghia island is rocky; the head of the bay is sandy, with extensive lagoons and marshes just in-shore of the beach; the land on the eastern side is well cultivated and rises in undulating ridges, with the rivers Jalova, Herias, and other streams running through the valleys to the sea. The water all round the eastern shore is comparatively shallow, the 5-fathoms line being 3 cables from the beach.

**Pylos shoals,** two rocky banks, with 6 fathoms least water and 4 cables apart in a north-east and south-west direction, lie in the southern approach to Navarin bay, at about  $1\frac{1}{2}$  miles S. by W.  $\frac{3}{4}$  W. from Pylos islet; between and around both banks the water is deep. The western side of Kuloneski islet, in Navarin bay, in line with the eastern side of Pylos islet, leads in the direction of the shoals. In strong winds the sea breaks heavily over these banks and all vessels should avoid them, especially those of deep draught.

St. Nikolo rocks, one above water, extend about half a cable off the shore abreast these shoals.

The  $4\frac{1}{2}$ -fathoms patch, south-east of Pylos island, has been mentioned above.

Plan.  
211 [886].  
Var. 5° 55' W.

**Foul ground**, 8 to 10 fathoms, rock, lies nearly in mid-channel just within the entrance of the bay, 5 cables S.E. by E.  $\frac{1}{2}$  E. from Marano point.

**Kuloneski islet or Marathonisi**, in the middle of the upper part of the bay, is about a cable in length, 25 feet high, rocky, and surrounded by a bank which within the 10-fathoms line extends 2 cables southward and  $2\frac{1}{2}$  cables westward of it. In the bay eastward of the islet, the ground is foul with the remains of sunken vessels destroyed in the battle fought on the 20th October 1827.

**Sphaghia shoal**.—This rocky shoal, about 2 cables in diameter, with 3 fathoms least water, lies in the north-western part of the bay, its shoalest part being 4 cables from Sphaghia island, and W. by N.  $\frac{3}{4}$  N. distant 8 cables from the centre of Kuloneski. The bridge over the river Xerias in line with the southern end of this islet, bearing E. by S., leads southward of the shoal.

**Aspect**.—The position of Navarin bay is indicated from a long distance seaward by the mountains in its neighbourhood. About 12 miles northward of the entrance, mount Agia rises 3,957 feet above the sea, the summits northward and southward of it being of much less height; farther southward is a dip or cut in the mountain; at 8 miles eastward of Navarin is the remarkable conical peak of mount Lykodemos, 3,132 feet high, with all the heights to the southward much lower. The higher mountains may be seen at a long distance from the westward, and, on a near approach to the land, mount St. Nikolo, a remarkable sharp peak 1,542 feet high, rising from the coast immediately southward of the entrance to Navarin bay, with a white church below the summit on its southern side.

Paleo Avarino, the ruined fortress on the northern side of Sikia channel; Navarin fort or Neo-Kastro, on the eastern side of the entrance to the bay; the steep whitish cliffs of the southern part of Sphaghia island; and Pylos islet, with its lighthouse, are all good guides for the entrance to Navarin bay; *see* view B. on chart 207.

**Directions**.—There are no dangers in entering Navarin bay in vessels of moderate draught. The fairway is about  $2\frac{1}{2}$  cables southward of Pylos island light; the Greek national flag on the flagstaff at fort Neo Kastro makes a good mark to steer for from seaward. *See* view B. on chart 207.

Vessels of deep draught coming from the southward should avoid Pylos banks of 6 fathoms, and the  $4\frac{1}{2}$  fathoms patch with a rock south-east of Pylos island.

**Anchorage**.—During the summer months, vessels usually anchor in about 19 fathoms at about half-a-mile northward of the town, with Navarin point S.S.W.  $\frac{1}{2}$  W. distant three-quarters of a mile, or nearer the point on that bearing if desirable. Small vessels anchor closer in, off the mole.

In winter, vessels anchor northward of Kuloneski islet in from 10 to 13 fathoms, off a large white building close to the beach near the watering place. There is less swell here than off the town and the squalls in south-westerly and north-westerly gales, particularly the latter, are less heavy; it is also more convenient for getting to sea and the water not so deep as off the town.

**Navarin or Neo-Kastro**.—This town, containing about 2,300 inhabitants, is prettily situated in a valley on the southern side of the bay; the houses are clean, and there is a post office, custom-house, quarantine

Lat. 36° 55' N.  
Long. 21 42 E.

office, and electric telegraph. The nearest railway station is Pyrgos, about 50 miles to the northward, which railway has a short line to Katakolo on the coast. Plan 211 [836].  
Var. 5° 50' W.

There is a small mole extending out from the west point of Neo-Kastro.

Fort Neo-Kastro, on the eastern side of the entrance and 181 feet above the sea, was formerly strong but is now dismantled, and used as a prison.

**Light.**—From an iron lamp-post on the mole-head at Neo-Kastro, at an elevation of about 25 feet above the sea, a small *fixed red* light is exhibited.

**Supplies.**—The town and fortress are supplied with water from an aqueduct which winds round the eastern hills up the first valley to the north, but shipping can obtain only small quantities from a fountain in the square. Excellent water, however, can be procured from the river Jalova as well as from springs, when at the anchorage in the northern part of the bay. A few bullocks and sheep may also be obtained.

**COAST.**—The coast from St. Nikolo rocks trends southward for 5 miles to Methoni, is everywhere rocky and steep-to, and a westerly swell is generally breaking on it. At one mile northward of Methoni are Kaliora islets or rocks, 5 feet high; Nisakulia, 60 feet high; and another smaller islet northward of the latter. The hills southward of mount St. Nikolo gradually decline in height towards Methoni. Chart,  
207 [804].

**METHONI or MODON**, ancient *Methone*, once a town of much importance, is now only a village, with about 1,000 inhabitants and no trade. On a point of land projecting about a quarter of a mile to the southward is an ancient Venetian fortress, now in ruins; it is united on the south to Sukule, a rocky islet 53 feet above the sea on which is a round tower. The shore on the western side of the fortress and round the islet is rocky. The ancient port, formerly formed by a mole running parallel with the fortress wall, is now filled with stones and sand, the remains of this old mole being level with the water; a marble pillar stands on a rock at the end of it a short distance eastward of the fortress wall. Plan of Methoni  
on chart,  
207 [804].  
Lat. 36° 49' N.  
Long. 21° 43' E.

**Mole.**—From the tower of the old fort on Sukule point, a mole or breakwater extends about 250 yards in a south-easterly direction, thence 110 yards eastward.

**Light.**—A *fixed red* light, elevated 29 feet above the sea, is exhibited from the head of the small pier at Methoni, visible in clear weather from a distance of 5 miles.

**Methoni channel** separates Sapienza island from the Morea, and is 8 cables wide from its northern extreme to Methoni mole, but a ridge of uneven ground, steep-to, extends southward from Sukule point to within 1½ cables of Karsee point, Sapienza. Plans on  
207 [804],  
682 [837].  
Lat. 36° 48' N.  
Long. 21° 43' E.

The depths on this ridge vary from 10 to 2½ fathoms, the latter depth being 2 cables from Sukule point; and at 3¼ cables from Sapienza there is a head with 4½ fathoms. Between the tail of the ridge and Sapienza, at less than a cable from Karsee point, the narrow channel has a depth of 11 fathoms.

From Methoni, a sandy shore curves round south-eastward forming a semicircular bay terminating in steep white cliffs, and bordered throughout by shallow water extending some distance off-shore. At half a mile south-eastward of the mole, and 1½ cables from the shore, with which it is connected by rocks many of which are awash, is Kuluras islet, 43 feet high, about 120 yards in diameter, and with sunken rocks extending nearly a cable outside it; the islet forms the eastern limit of the anchorage.

Plans on  
207 [804].  
682 [837].  
Var. 5° 50' W.

**Anchorage.**—The usual anchorage was formerly in the middle of the bay, eastward of the round tower, in about 7 fathoms, sand; but it was seldom resorted to except for temporary shelter against strong north-westerly winds. The ridge before mentioned affords some protection from the westward, but, with south-westerly winds, a heavy sea rolls in and renders it unsafe.

The mole or breakwater, which is about 360 yards in length, no doubt affords necessary shelter alongside for such vessels as visit the port.

**Directions.**—From the westward, a large vessel should pass a short cable northward of Sapienza, and, when the end of the breakwater bears northward of N. by E., steer for the anchorage in the middle of the bay.

From the eastward, vessels entering Methoni channel should keep in mid-channel, where the depth is from 20 to 22 fathoms; the water shoals rapidly on either side within the depth of 10 fathoms; haul up for the breakwater when its extreme bears N.N.W., and when abreast Kuluras islet, steer as requisite. In moderate weather, the current sets westward through the channel at about a mile an hour.

Lat. 36° 47' N.  
Long. 21 46 E.

**COAST.**—**Kolivri point**, 3 miles south-eastward of Methoni, is a promontory 228 feet high, and has the appearance of a round islet; it is skirted by rocks at the distance of a quarter of a mile, one of which is above water. The shallow water round Methoni bay continues along shore to Kolivri point.

Three-quarters of a mile eastward of Kolivri point is a rock above water, close to the shore, with a sunken rock outside it; between these rocks and the point there is a  $2\frac{1}{2}$ -fathoms patch.

Plan on  
682 [837].  
Lat. 36° 46' N.  
Long. 21 43 E.

**SAPIENZA ISLAND**, ancient *Enusai*, 8 cables from the coast of the Morea, is  $3\frac{1}{2}$  miles in length north and south, and irregular in breadth, its extreme being about  $1\frac{1}{2}$  miles across; the northern part is 740 feet high, the hills gradually declining in height to the southward, and from the north-westward the island appears triangular, sloping towards the south. At the north-eastern part of the island, an elevated spur projecting eastward is bordered on its northern side by shallow water to the distance of a quarter of a mile, narrowing the Methoni channel for large vessels as before described.

The western coast is sinuous with scattered rocks along its southern part; at the southern end of the island, the lighthouse is a conspicuous object; just off it are some sharp dark rocks named Thio Adelphi; elsewhere, the coast of the island is rocky, and, in general, steep-to. The 100-fathoms contour-line of soundings passes within half a mile of the south-western part of the island, and so rapidly does it deepen in this direction that between 4 and 7 miles from the island the depth is from 1,300 to 2,000 fathoms.

**Port Longo**, on the south-eastern side of the island, is fronted by an islet with a large rock just westward of it, both of which should be left on the starboard hand in entering, the passage northward of the islet being shallow. The port is only used by fishing boats and by small vessels seeking shelter against north-westerly and south-westerly gales; the anchorage is in a depth of 7 to 10 fathoms. The island is inhabited by shepherds.

**LIGHT.**—From an octagonal tower, 57 feet high, on the south-west summit of Sapienza island, at an elevation of 358 feet above the sea, a

*flashing white light* is exhibited, with a period of *one minute*, thus:—Flash, *seventeen seconds*; eclipse, *forty-three seconds*. It is visible in clear weather from a distance of 25 miles, between the bearings of S. 2° E., through east and north, to N. 50° W., and can also be seen over Skhiza island, when 12 miles distant, through a small arc on a N. 56° W. bearing.

Plan on  
682 [837].  
Var. 5° 50' W.

**Santa Mariani islet**, nearly in mid-channel between Sapienza and Skhiza islands, is about half a mile in length and 100 feet high, with deep water in the channels on either side, but with shallow water extending a short distance from its north-eastern side.

**Skhiza island**, 2 miles south-eastward of Sapienza, is 3½ miles in length, 1½ miles nearly in breadth, and has a round hill near its northern end 644 feet high; with the exception of this hill, the island is generally flat, rocky, and barren, affording only pasturage for a few goats. It has deep water nearly all round, but the southern point is foul to a short distance.

Lat. 36° 44' N.  
Long. 21 46 E.

Port Skhiza, a small cove on the south-western side used only by small coasting craft, has a rocky 4½-fathoms shoal in the middle of the entrance.

**Arnatzí rock**, about 4 cables from the eastern side of Skhiza island, is black and about 30 feet high, with a sunken rock close north-west of it; the water round the rock is deep, but a 2-fathoms bank extends about a cable off the shore of Skhiza abreast Arnatzí rock.

**CAPE GALLO**, ancient *Acritas*, is a steep rugged pinnacle united to the main by a low neck of land and is nearly 7 miles south-eastward of Kolivri point; the intervening coast forms a bay, and off the sandy beach on the northern side there is anchorage with off-shore winds in a depth of 7 or 8 fathoms, sand.

Chart,  
207 [834].  
Plan, Gulf of  
Kalamata  
682 [837].  
Lat. 36° 48' N.  
Long. 21 53 E.

From the north-eastern corner of the bay, the coast trends southward, is at first rocky, and then sand as far as cape Gallo, backed by a ridge of moderate height.

**Venetico island**, ancient *Theganussa*, is about a mile in length north and south, 570 feet high, and remarkable for its steep and broken appearance; its northern extreme is a low point of shingle, from which a shoal with from 3 to 5 fathoms water, extends N.N.E. half a mile, when the water suddenly deepens. At the southern end of Venetico, rocks lie off its western and eastern extremes.

Vessels taking the passage between Venetico and cape Gallo, should keep near the cape so as to avoid Venetico shoal extending northward from the island.

A current, influenced by the force and direction of the wind, sometimes sets through the passage at the rate of 1½ or 2 miles an hour.

**Petra Karavo**, or *Avgo*, are three rocks or islets a mile southward of Venetico island; the largest is about 30 feet high, with shallow ground extending a cable to the southward, and 8 fathoms at 2½ cables in that direction; the other two islets are much smaller and northward of the former. Midway between these islets and Venetico there is a depth of 24 to 40 fathoms.

Lat. 36° 40' N.  
Long. 21 54 E.

**GULF OF KALAMATA (Kalamai)**, ancient *Messiniakos*.—**General remarks.**—**Aspect.**—The gulf of Kalamata is the deep inlet receding to the northward 18 miles from the parallel of cape Gallo, and included between cape Gallo on the west and cape Matapan on the

Lat. 36° 50' N.  
Long. 22 10 E.

Plan, Gulf of  
Kalamata,  
682 [837].  
Chart,  
1,685 [838].  
Var. 5° 40' W.

east; these capes lie from each other north-west and south-east, and are about 36 miles apart.

The remarkable cone of mount Lykodemos, 3,132 feet high, rises about  $12\frac{1}{2}$  miles northward of cape Gallo, and its eastern slopes with those of the chain of hills between, form the western coast of the gulf. The northern shore is part of the fertile valley of Parnissus, through which the river Parnatza flows, running into the sea at the head of the gulf; where also several small rivulets discharge, but these are mostly dry in summer. The eastern coast is that of the peninsula of Mani or Maina, terminating southward in cape Matapan and backed by a chain of lofty mountains.

The most conspicuous of the mountains on the Mani peninsula which divides the gulfs of Kalamata and Kolokithia are, mount St. Elias or Makryno, ancient *Taygetus*, which rises 7,987 feet above the sea, on the parallel of 36° 56' N., and about 7 miles from the shore of the gulf, its summit being always covered with snow, except during midsummer. Mount Mavro, 6,274 feet high,  $3\frac{1}{2}$  miles to the southward; mount Kubenova\*,  $6\frac{1}{2}$  miles farther south, with an elevation of 4,827 feet; the Sanghia mountain, 3,800 feet high, 15 miles northward of cape Matapan; mount Mamotika, 11 miles northward of the cape, 3,530 feet high; mount Kakovuni, 3,000 feet high,  $2\frac{1}{2}$  miles south of mount Miniatika; and the hills between this latter mountain, in gradual descent to cape Matapan.

\*Lat. 36° 47' N.  
Long. 22 25 E.

In clear weather, the lofty mountains may be sighted at a great distance; mount St. Elias is, however, frequently enveloped in clouds except during the dry summer months, and should the weather be clear excepting in the direction of that mountain, the observer may feel assured that under those clouds is mount St. Elias. With south-easterly winds, these mountains are covered with clouds and the lower parts only are visible; a practical knowledge of their outline is therefore valuable.

**Wind and weather.**—The winds which blow out of the gulf are at times of great force. In ordinary weather, the wind blows from the gulf during the night and from seaward during the middle of the day, it is subject to sudden changes and heavy squalls, usually attended with heavy rain, thunder, and lightning, especially during autumn and winter, the wind shifting in a few minutes from S.E. to N.E., blowing furiously for a few hours, and then backing round to its original quarter.

Southerly winds seldom blow home, but a tremendously heavy swell then rolls into the gulf. In strong southerly gales, vessels seek the anchorage at Petalidi on the western shore, and Armyro and Kitries on the eastern side of the gulf.

Plan of Koroni  
anchorage on  
chart,  
207 [834].  
Lat. 36° 48' N.  
Long. 21 58 E.

**Koroni bay.**—The castle of Koroni, ancient *Asine*, 6 miles north-eastward of cape Gallo, stands on an elevated plateau, on a rocky tongue of land projecting a mile in an easterly direction and terminating in Livadia point; the castle bears evidence of having once been a fortress of considerable strength, as its embattled walls, massive round towers, and subterranean passages, now in ruins, are visible in every direction.

**The town** of Koroni extends along the shore on the north-western side of the castle and contains about 2,000 inhabitants; it has a fair trade in olives, oil, fruit, and excellent wine.

A road along the shore leads from Koroni through Petalidi to Kalamata.

**Anchorage.—Mole.**—A small mole projects about one cable N.N.E. from the town, affording shelter to small craft from south-easterly winds; the anchorage for large vessels is from 4 to 8 cables off-shore, in a depth of 8 to 10 fathoms, mud.

**Light.**—A *fixed red* light, elevated 23 feet above the sea, is exhibited from a metal pole 19 feet high on the mole head at Koroni, visible in clear weather from a distance of 5 miles.

When approaching from the southward, a fair berth should be given to Lividia point, as a strong current at times sweeps round it. The shore in front of the town is rocky, and, at the point half a mile north-westward of the mole, rocks extend nearly a quarter of a mile off-shore; small vessels intending to take up an in-shore berth should not anchor westward of the town. This is an excellent anchorage during a southerly or south-westerly gale.

With north-easterly or gulf winds, there is anchorage about half a mile from the shore in the sandy bay south-westward of the castle in 9 or 10 fathoms, sheltered from these winds, which at times blow with great force.

**Petalidi bay.**—From Koroni, the coast trends northward nearly 10 miles to Petalidi, and is skirted here and there by rocks; about 2 miles from Koroni there is good anchorage a mile from the shore in depths of 10 to 12 fathoms, muddy sand. In the vicinity, excellent fresh water runs into the sea, and there are two or three villages, whose inhabitants are very poor. The land is well cultivated with the vine, and extensive plantations of olive trees cover the slopes of Lykodemos.

The village of Petalidi, ancient *Corone*, at the foot of mount Lykodemos, stands on the shore of a small shallow bay open to the north-east and formed by a low point; projecting from this point are the remains of an ancient mole, which, together with some rocks, reach nearly 2 cables from the point.

The bay is sheltered from all winds but those from the south-eastward which seldom blow home. Coasting vessels anchor in shallow water, sheltered by the mole, and remain for the winter; larger vessels anchor northward of the point and at about half a mile from the shore in a depth of 6 or 7 fathoms. The bay may be known by a white church on the point.

**Light.**—A *fixed red* light, elevated 24 feet above the sea, is shown from an iron shed 19 feet high, at Petalidi, visible in clear weather from a distance of 5 miles.

**Water** may be obtained from the river Iane, about a mile northward of Petalidi.

**Coast.**—The low shore of the plain which bounds the head of the gulf of Kalamata commences northward of Petalidi, and, bending round eastward at 2 miles northward of that place, from thence trends eastward about 10 miles to the north-eastern head of the gulf; in the interior are the lofty mountains of Arcadia.

**Pyrnatza river** runs into the gulf about  $4\frac{1}{2}$  miles north-eastward of Petalidi; the bar has but 2 feet water over it and is dangerous at times. The river abounds in fish, particularly lobsters, which are of large size.

**Nisi village**, on the bank of the Pyrnatza, about 4 miles from its mouth, carries on a considerable trade, the produce from the interior being brought down the river in boats and shipped on board vessels at anchor

Plan, Gulf of Kalamata, 682 [837].  
Var. 5° 40' W.

Plan of Petalidi bay on chart, 207 [834].  
Lat. 36° 57' N.  
Long. 21° 57' E.

Plan, 682 [837].

Lat. 37° 1' N.  
Long. 22° 0' E.

Plan,  
682 [837].  
Var. 5° 40' W.

Skeleton plan of  
Kalamata  
harbour on  
682 [837].  
Lat. 37° 1' N.  
Long. 22 7 E.

off the river's mouth. The produce is corn, oil, wine, currants in large quantities, potatoes, and dried figs. The anchorage off the river is in a depth of about 8 fathoms.

**KALAMATA** (*Kalamai*), near the north-eastern corner of the gulf, and from which the gulf takes its name, is at the foot of a little hill on which is the ancient acropolis of *Pharæ* about a mile from the sea.

The harbour of Kalamata is formed by a breakwater extending in a southerly direction from the shore about 200 yards, when it turns south-eastward for about 700 yards, terminating in 29 feet of water, enclosing depths of from 16 to 18 feet. The entrance, between the eastern end of the breakwater and a mole stretching out from the shore, is about 200 yards in width. Dredging operations are in progress.

**Lights.**—From a mast within the breakwater head, and elevated 26 feet above the sea, a small *fixed red* light is exhibited, visible from a distance of about 3 miles.

A *fixed green* light is exhibited from the mole head, north side of entrance.

**Directions.—Anchorage.**—The harbour will probably accommodate most of the vessels trading to the place. There is temporary anchorage in a depth of about 12 fathoms, sandy bottom, outside the breakwater. The port may be known at some distance by the castle or acropolis, which appears above the trees, and on a near approach, the breakwater and the houses on the beach will be seen.

The town is surrounded by vineyards and olive plantations, with the broad bed of the Nedon, a mountain stream, passing close westward of it; the main part of the town is about  $1\frac{1}{2}$  miles from the beach, and is considered healthy, occasional cases of ague, cured by strong doses of quinine, being the only disease in any degree common. It is rapidly increasing in size and importance as a seaport.

**Population.**—Kalamata had a population of 11,642 at the census of 1897.

**Communication.**—Kalamata carries on a brisk trade, has a regular communication with Athens three times a week, and is in direct railway connection with it. Greek and Austrian Lloyd's steamers call regularly. The custom-house is near the beach. Consular agents of different nations reside here.

**Supplies.**—Supplies and provisions of all kinds are abundant, and cheap, but no coal can be procured, nor are there any facilities for repairs for shipping.

**Trade.**—Exclusive of coasting vessels, about 200 steam vessels and sailing ships, of an aggregate of 95,000 tons, call annually. The principal exports are figs, currants, wine, oil, silks, skins, valonia, &c.; the imports, manufactures, colonials, iron, sulphur, rice, glass, salt fish, wood, sugar, and hardware.

Lat. 37° 0' N.  
Long. 22 9 E.

**Armyro bay**, 2 miles east-south-eastward of Kalamata, affords some shelter during south-east gales, in a depth of 10 fathoms, under very high land 3 cables from the shore, and somewhat sheltered by cape Kitries, the most salient point of the eastern coast of the gulf. Before the harbour was formed at Kalamata, vessels sought shelter in this bay when Kalamata road was not tenable. Here vessels lie in safety, almost becalmed as the wind does not blow home, though a very heavy swell sets in,

North-westerly winds blow furiously off the plain within Kalamata, but the water is then smooth. The village of Armyro is of no great extent. Plan, 682 [837].  
Var. 5° 30' W.

**Kitries bay.**—Southward of Armyro bay, and about  $5\frac{1}{2}$  miles from Kalamata harbour, is Kitries bay, sheltered from the southward by cape Kitries; but, being inconveniently deep, having 35 fathoms in the middle and from 18 to 20 fathoms half a cable from the shore, and exposed to north-westerly winds, it is seldom resorted to. Coasting vessels anchor close to the shore and make fast to the rocks on the southern side of the bay; the holding ground is good.

The inhabitants of the little village near the shore are very poor. During summer, the lofty mountains which rise in the vicinity of the bay, and the calms usual at that season, cause great heat.

**CAPE KITRIES**, immediately southward of the bay of that name, is a bold round promontory, 1,148 feet high, the most western point of the eastern side of the gulf of Kalamata, clear of danger, and steep-to; it is easily recognised and is conspicuous from the southward. Lat. 36° 56' N.  
Long. 22° 8' E.

**LIGHT.**—On cape Kitries stands a lighthouse 36 feet high, from which, at an elevation of 102 feet above the sea, is exhibited a *flashing white light* every *half minute*, visible in clear weather from a distance of 10 miles.

**The Coast** from cape Kitries trends south-eastward 3 miles to cape Kurtissa, and then falls back in a north-easterly direction forming a bay about a mile deep, of which Chapel islet marks the eastern limit. The islet is close to the shore, and so named from having a chapel on its summit; it shelters an anchorage for small coasting craft. Chart, 1,685 [838].

The village of Skardamula, containing about 90 houses, may be seen on the slope of a hill, a spur of mount St. Elias, whose white summit rises majestically to the north-east, about 7 miles from the shore of the bay.

At  $2\frac{1}{2}$  miles southward of Chapel islet is Stupar point, a small projection surrounded by a reef at the distance of more than half a mile; on the reef and 3 cables from the shore, is a submarine spring. The rugged and barren coast continues southward for 10 miles farther to the entrance of port Limeni; nearly midway is the projection named cape Trakhela. The land in general about port Limeni is high, mountainous, and barren. With strong south-westerly winds the sea breaks heavily all along this coast.

**Light.**—At port Kardamilli (Skardamula), north of jetty, near Chapel islet, a *fixed red* light is exhibited, elevated 45 feet above the sea, and visible in clear weather from a distance of 5 miles.

**Port Limeni** is the best natural port in the gulf of Kalamata; its entrance, 4 cables wide, is open to the westward, from whence it extends eastward more than a mile, and widens by a curve in the southern shore towards the houses of Limeni. Lat. 36° 41' N.  
Long. 22° 23' E.

In approaching the port, the water is very deep; but, within, the depths are from 10 to 4 fathoms. It is necessary to moor off Limeni on the southern side of the port.

North-eastward of the head of the port is the village of Vitylo; southward of Limeni is the town of Tsimova. The neighbouring peasantry use all these names for the port.

**Light.**—A *fixed red* light is exhibited from a dwelling about 21 feet high at port Limeni, at an elevation of 42 feet above the sea, visible in clear weather from a distance of 5 miles.

Chart,  
1,685 [838].  
Var. 5° 30' W.

**The coast** from port Limeni trends southward for 9 miles to port Mezapo; in the intermediate coast are several indentations all open to the west, of which the principal are Dyko, Spazari, and Artzi bays.

Lat. 36° 31' N.  
Long. 22° 24' E.

**Port Mezapo** is open north-westward, 6 cables wide at the entrance, and 7 cables in extent in a south-easterly direction. The water is deep, there being from 30 to 20 fathoms. Vessels moor in the eastern angle of the port, near the houses of Mezapo.

A rather high tongue of land terminating in Tigani point forms the western side of the bay and shelters it from south-westerly winds and sea. The termination is remarkable, being whitish, steep, level on the summit, with the ruins of a tower on it, and, being joined to lower land on the south, it appears almost like an islet.

The village of Mani, containing about 100 houses, may be seen  $1\frac{1}{2}$  miles from the bay, on a level on the slope of mount Miniatika, which rises 3,530 feet above the sea and is a good mark. When coming from seaward, the land of cape Grosso is also a mark for the port, and may be approached at discretion.

Lat. 36° 28' N.  
Long. 22° 23' E.

**Cape Grosso.**—At 2 miles south-westward of port Mezapo is Kipula point, the north-western extreme of a remarkable promontory, of which the sea face forms an outward curve for about 4 miles northward and southward under the name of cape Grosso; it is an elevated plateau 1,235 feet high, almost level, and rising abruptly from the sea. The scattered houses of Orias on the tableland are marked by a terrace on the south caused by a landslip, the result of an earthquake. The coast is of a reddish colour and steep-to, there being a depth of 150 fathoms at the distance of a mile.

**Iali bay.**—From the southern extreme of Grosso promontory to cape Matapan, at a distance of  $6\frac{1}{2}$  miles south-eastward, the coast trends inwards forming a broad bay, at the northern end of which is Iali bay with an indentation running in northward about half a mile to Gerolimena at its head.

**Light.**—From a dwelling at Gerolimena, 21 feet high, a *fixed red* light is exhibited at an elevation of 56 feet above the sea, visible in clear weather from a distance of 5 miles.

Lat. 36° 25' N.  
Long. 22° 29' E.

**Port Marmari**, at 3 miles northward of cape Matapan is a depression or saddle in the land, and here, on the eastern side of the Matapan promontory, is the port of Kaio, and on the western side the little port of Marmari, the heads of the two ports being only 3 cables apart and separated from each other by the neck of land forming the saddle. Marmari is open to the westward, 3 cables wide, and about the same in extent.

Coasting craft anchor off a small inlet on the southern side of the port. The position of the port may be known by the saddle, by an old tower on a little hill on a northern side of the entrance, and by another town farther eastward over port Kaio, which is also conspicuous.

Lat. 36° 24' N.  
Long. 22° 29' E.

**Karavi islet**,  $4\frac{1}{2}$  miles north-westward of cape Matapan, is about 2 cables in diameter and 47 feet high, with a sunken rock close to its northern extreme; about a cable southward of Karavi is Kenesta rock, nearly awash, and with some sunken rocks extending about 2 cables from its southern extreme. These should be given a berth at night by observing the bearing of cape Matapan light.

**CAPE MATAPAN**, ancient *Tenaron*. — **Aspect.** — Cape Matapan is the termination of a peninsula, 3 miles in length, joined to that of Mani on the north, by the isthmus, only 3 cables in breadth, which separates the little ports of Marmari and Kaio; this peninsula consists almost entirely of dark grey marble. For  $1\frac{3}{4}$  miles from the extreme of cape Matapan, the land rises regularly from south to north to a height of 1,025 feet at Matapan peak, and then falls suddenly abruptly towards the isthmus; therefore, when seen from eastward or westward at a distance of 12 miles or more, it appears as a triangular or wedge-shaped island. When the distance is so great that the high land of the cape is below the horizon, mount Miniatika, 3,530 feet high, and 11 miles northward of the cape, will probably be seen, and its southern slope must not be mistaken for the high land of the cape, which will become visible on a nearer approach.

Charts,  
1,685 [838].  
3,372 [879].  
Lat.  $36^{\circ} 22' N.$   
Long.  $22^{\circ} 29' E.$   
Var.  $5\ 30\ W.$

When immediately southward of the cape, its extreme cannot be recognised unless the lighthouse can be distinguished, on account of the high land behind it, but on the west are the steep cliffs of cape Grosso forming regular terraces, and on the east Kisternes hills, 344 feet high, rising immediately above Kisternes point will be prominent.

Cape Matapan is steep-to and clear of danger and may be approached to a prudent distance, there being a depth of 30 fathoms near it. The current in its vicinity generally sets westward at about one knot an hour. When under sail, with strong northerly winds and near the coast, it is necessary to be prepared for the baffling and heavy squalls which blow from the high land. A landing may be effected in fine weather, on the eastern side of the cape immediately under the lighthouse.

**LIGHT.**—From a lighthouse of masonry, near the extreme of cape Matapan and at an elevation of 145 feet above the sea, is exhibited a *fixed white* light, varied by a *red* flash every *two minutes*, visible in clear weather from a distance of 16 miles, but obscured by Kisternes point when bearing south of  $S. 49^{\circ} W.$  Reported irregular, March 1905.

**For coast** eastward of cape Matapan, see “Mediterranean Pilot,” Vol. IV.

---

General chart, 1,800 [815].

PLACE.—ANCONA. OBS.  $\Delta$  LAT.  $43^{\circ} 37' N.$ , LONG.  $13^{\circ} 31' E.$   
 METEOROLOGICAL TABLE COMPILED FROM 15 TO 25 YEARS' OBSERVATIONS.

MONTH.	BAROMETER* At 32° F. and Mean Sea Level.				AIR TEMPERATURE.						Relative Humidity Scale 0 to 10.		RAIN.			WIND								No. of Days Gale.	No. of Days Fog.							
	Mean.		Absolute.		Mean.			Absolute.			Total Fall.	No. of Days.	Max. Fall in 24 hours.	Mean Force, Beaufort Scale.	Number of Days from																	
	For Month.	Daily Range.	Max.	Min.	Range.	Max.	Min.	Range.	N.	N.E.					E.	S.E.	S.	S.W.	W.	N.W.	Calm.											
January	Ins.	20-07	Ins.	29-10	1-76	41	45	37	8	62	24	38	80	%	Ins.	10	1-83	—	3	1	1	3	2	2	10	7	2	—	—			
February	—	20-05	—	28-88	1-73	44	49	40	9	64	24	40	76	%	Ins.	7	3-15	—	2	2	1	5	3	1	8	5	1	—	—			
March	—	20-85	—	30-48	1-33	50	54	44	10	75	30	45	71	%	Ins.	9	1-21	—	2	2	3	7	3	2	5	5	2	—	—			
April	—	20-78	—	30-25	20-10	1-15	57	61	51	10	74	39	35	71	%	Ins.	9	1-18	—	2	2	3	8	4	2	4	4	1	—	—		
May	—	20-85	—	30-25	29-17	1-08	64	70	59	11	89	46	43	69	%	Ins.	8	1-42	—	2	2	3	8	4	2	4	4	2	—	—		
June	—	20-88	—	30-21	29-38	0-83	72	78	60	18	94	51	43	64	%	Ins.	7	1-26	—	1	2	3	8	5	2	4	4	1	—	—		
July	—	20-86	—	30-21	29-46	0-75	78	84	71	13	100	56	44	57	%	Ins.	4	1-56	—	2	2	4	8	4	1	4	5	1	—	—		
August	—	20-88	—	30-26	29-42	0-84	77	82	71	11	99	54	45	60	%	Ins.	4	1-40	—	3	2	3	7	4	2	4	5	1	—	—		
September	—	20-93	—	30-41	29-44	0-97	71	75	65	10	93	48	45	66	%	Ins.	0	4-73	—	2	2	3	7	4	2	4	5	1	—	—		
October	—	20-80	—	30-50	29-15	1-35	62	66	57	9	88	36	52	71	%	Ins.	9	2-48	—	2	2	2	7	4	3	6	4	1	—	—		
November	—	20-92	—	50-57	29-04	1-53	51	55	48	7	72	34	38	78	%	Ins.	10	2-32	—	2	1	1	5	3	2	9	6	1	—	—		
December	—	20-92	—	30-60	28-92	1-68	44	48	40	8	63	21	42	78	%	Ins.	9	1-22	—	2	2	1	3	3	2	10	7	1	—	—		
Means	—	29-80	—	—	—	—	59	64	54	10	—	—	—	70	%	Ins.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Totals	—	—	—	—	—	—	—	—	—	—	—	—	—	—	%	Ins.	92	—	—	25	22	28	76	43	23	72	61	15	—	—	—	
Absolute Values	—	—	—	30-86	28-88	1-98	—	—	—	—	100	21	79	—	%	Ins.	—	4-73	—	—	—	—	—	—	—	—	—	—	—	—	—	—
No. & Years' Observations	25	—	16	—	—	—	24	15	16	15	15	15	15	15	%	Ins.	16	—	—	—	—	—	—	—	—	—	—	—	—	—	—	15

\* Correction for Gravity—0.01 not applied.

Authorities :—" Annali dell' Ufficio Centrale Meteorologico—Italiana."  
 Buchan's "Challenger" Report.

Meteorological Office,  
 4th July 1908.



PLACE.—PATRAS. OBS.  $\Delta$  LAT.  $38^{\circ} 15' N.$ , LONG.  $21^{\circ} 44' E.$   
 METEOROLOGICAL TABLE COMPILED FROM 2 TO 5 YEARS' OBSERVATIONS.

MONTH.	BAROMETER, At 32° F., and Mean Sea Level.				AIR TEMPERATURE.						Relative Humidity (Cloud Amount, Scale, 0 to 10.)		RAIN.			WIND										No. of Days Gales.	No. of Days Fogs.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
	Mean (8 a.m.)		Absolute.		Mean.			Absolute.			Range.	For Month.	Range.	Max.	Min.	Range.	Max.	Min.	Range.	No. of Days.	Max. fall in 24 hours.	Mean Force, Beaufort Scale.	Number of Days from																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
	For Month.	Daily Range.	Ins.	Max.	Min.	Range.	Max.	Min.	Range.	Max.													Min.	Range.	Ins.			Total Fall.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
January	Ins.	30-21	—	Ins.	30-63	29-62	1-01	Ins.	50	57	43	14	65	32	33	67	4	3-72	10	1-96	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	

\* Correction for Gravity—0.02, not applied.

Authority :—"Quarterly Journal of the Meteorological Society."

Meteorological Office,  
4th July 1908.

PLACE.—POLA. OBS. Δ LAT. 44° 52' N., LONG. 13° 50' E.

METEOROLOGICAL TABLE COMPILED FROM 10 TO 36 YEARS' OBSERVATIONS.

MONTH.	BAROMETER* At 32° F. and Mean Sea Level.				AIR TEMPERATURE.						RAIN.				WIND.										No. of Days Gale.	No. of Days Fog.				
	Mean.		Absolute.		Mean.			Absolute.			Total Fall.	No. of Days.	Max. Fall in 24 hours.	Mean Force, Beaufort Scale.	Number of Days from															
	For Month.	Daily Range.	Max.	Min.	Range.	Max.	Min.	Range.	N.	N.E.					E.	S.E.	S.	S.W.	W.	N.W.	Calm.									
January	Ins.	30-08	Ins.	28-91	1-95	Ins.	41	46	36	10	59	15	44	76	5	2-15	0	1-66	2	4	5	8	3	1	1	2	2	4	3	4
February	30-03	—	30-76	28-99	1-77	Ins.	42	48	37	11	61	20	41	75	5	2-10	9	1-36	2	3	4	8	3	1	1	2	3	3	5	
March	29-03	—	30-58	29-11	1-47	Ins.	47	54	41	13	72	22	50	75	5	3-05	11	1-77	2	2	4	8	5	3	1	2	3	3	5	
April	29-09	—	30-46	29-05	1-41	Ins.	53	60	47	13	75	28	47	75	5	2-97	12	2-36	2	1	3	7	7	3	2	2	2	3	4	
May	29-04	—	30-34	29-20	1-14	Ins.	62	68	54	14	86	27	59	73	5	2-51	10	2-18	2	2	2	7	6	3	2	2	3	4	3	
June	29-05	—	30-28	29-34	0-94	Ins.	69	76	60	16	94	50	44	72	4	2-85	10	4-97	2	2	2	6	5	3	2	3	3	4	1	
July	29-06	—	30-32	29-49	0-93	Ins.	74	83	65	18	97	52	45	67	3	1-80	8	1-98	1	2	2	6	4	3	2	3	4	5	1	
August	29-06	—	30-30	29-30	1-00	Ins.	73	82	65	17	97	52	45	69	3	2-60	7	2-66	2	2	3	7	4	2	2	3	4	4	2	
September	30-00	—	30-45	29-27	1-18	Ins.	87	74	60	14	91	39	52	74	4	3-73	9	3-96	2	2	3	8	5	2	2	3	2	3	2	
October	29-08	—	30-50	29-17	1-33	Ins.	59	64	52	12	83	33	50	77	5	4-73	10	3-81	2	2	2	4	8	5	3	2	2	2	3	4
November	30-01	—	30-63	28-91	1-72	Ins.	50	55	44	11	89	28	41	77	6	3-62	12	3-07	2	3	5	8	4	2	1	2	2	3	5	
December	30-01	—	30-66	29-01	1-65	Ins.	44	49	39	10	85	20	45	77	6	3-62	11	2-79	2	3	6	7	3	2	1	2	3	4	4	
Means	29-08	—	—	—	—	Ins.	57	63	50	13	—	—	—	74	5	—	—	—	2	—	—	—	—	—	—	—	—	—	—	—
Totals	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	35-73	118	—	—	28	43	88	54	28	19	28	35	42	40
Absolute Values	—	—	30-86	28-91	1-95	—	—	—	—	—	97	15	82	—	—	—	—	4-97	—	—	—	—	—	—	—	—	—	—	—	—
No. & Years' Observations	36	—	30	30	—	36	—	30	30	—	30	—	30	—	30	—	30	—	20	—	—	—	—	—	—	—	—	—	—	10

\* Correction for Gravity—Nil.

Authorities :—Meteorological Observations, Pola.  
Buchan's "Challenger" Report.

Meteorological Office,  
4th July 1908.

PLACE.—RAGUSA. OBS.  $\Delta$  LAT.  $42^{\circ} 38' N.$ , LONG.  $18^{\circ} 7' E.$   
METEOROLOGICAL TABLE COMPILED FROM 15 TO 27 YEARS' OBSERVATIONS.

MONTH.	BAROMETEL* At 32° F. and Mean Sea Level.						AIR TEMPERATURE.						Relative Humidity. Scale 0 to 10.			RAIN.			WIND.										No. of Days Gale.	No. of Days Fogs.
	Mean.		Absolute.		Range.		Mean.		Absolute.		Range.		For Month.	°	Total Fall.	No. of Days.	Max. Fall in 24 hours.	Mean Force, Beaufort Scale.	Number of Days from											
	Daily Range.	Ins.	Max.	Min.	Range.	Max.	Min.	Range.	Max.	Min.	Range.	N.							N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calim.				
January	30-01	—	30-82	29-06	1-76	48	—	—	—	61	24	37	60	5	7-29	12	5-01	—	3	0	4	4	1	2	1	1	6	4	—	
February	30-01	—	30-70	29-01	1-69	49	—	—	—	66	25	41	60	4	4-08	9	2-56	—	3	7	2	4	1	1	2	2	6	2	—	
March	29-04	—	30-45	29-19	1-26	52	—	—	—	78	29	49	63	5	5-00	12	4-02	—	3	5	2	7	1	2	2	2	7	2	—	
April	29-08	—	30-41	29-25	1-16	58	—	—	—	82	43	39	66	5	5-19	12	3-70	—	2	3	2	9	1	1	2	2	8	1	—	
May	29-02	—	30-29	29-21	1-08	65	—	—	—	88	47	41	65	4	2-26	9	2-44	—	2	2	2	6	1	2	2	3	11	1	—	
June	29-04	—	30-21	29-55	0-66	72	—	—	—	90	58	32	64	3	2-81	7	5-12	—	1	2	1	6	1	1	4	3	11	1	—	
July	29-02	—	30-17	29-60	0-57	77	—	—	—	93	65	28	62	2	1-58	4	2-13	—	1	4	1	5	1	1	2	4	12	0	—	
August	29-03	—	30-25	29-61	0-64	77	—	—	—	90	63	27	62	2	2-00	4	3-54	—	1	6	1	5	1	1	1	5	10	0	—	
September	29-09	—	30-40	29-37	1-03	72	—	—	—	87	54	33	66	3	4-51	6	4-02	—	1	6	1	6	1	1	1	3	10	1	—	
October	29-09	—	30-40	29-37	1-03	64	—	—	—	84	38	46	68	5	8-49	12	5-63	—	2	4	1	10	1	2	2	1	8	2	—	
November	29-09	—	30-55	29-13	1-42	56	—	—	—	69	36	33	65	5	6-18	12	4-02	—	2	6	2	8	1	1	2	2	6	3	—	
December	29-08	—	30-60	29-17	1-43	50	—	—	—	65	27	38	64	5	7-07	13	5-55	—	3	8	3	6	1	2	1	1	6	3	—	
Means	29-06	—	—	—	—	62	—	—	—	—	—	—	—	64	4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Totals	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Absolute Values	—	—	30-82	29-01	1-81	—	—	—	—	93	24	69	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
No. & Years' Observations	27	15	27										15																	

\* Correction for Gravity 0.01, not applied.

Authorities:—"Jahrbuch der K. K. Central-Anstalt für Meteorologie," &c., Austria.  
Buchan's "Challenger" Report.

Meteorological Office,  
4th July 1908.

PLACE.—VENICE. OBS.  $\Delta$  LAT.  $45^{\circ} 26' N.$ , LONG.  $12^{\circ} 20' E.$   
METEOROLOGICAL TABLE COMPILED FROM 19 TO 35 YEARS' OBSERVATIONS.

MONTH.	BAROMETER* At 32° F. and Mean Sea Level.						AIR TEMPERATURE.						RELATIVE HUMIDITY. Scale 0 to 10.				RAIN.			WIND												No. of Days Gales	No. of Days Fog.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
	Mean.		Absolute.				Mean.			Absolute.			Range.	Total Fall.	No. of Days.	Max. Fall in 24 hours.	Mean Force, Beaufort Scale.	Number of Days from																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
	For Month.	Daily Range.	Max.	Min.	Ins.	Range.	Max.	Min.	°	°	°	°						N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
	Ins.	Ins.	Ins.	Ins.	Ins.	°	°	°	°	°	°	°	%	Ins.	Ins.	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°

\* Correction for Gravity—Nil.

Authorities:—"Annali dell' Ufficio Centrale Meteorologico—Italiana."

"Bollettino Mensile dell' Osservatorio Meteorologico—Venezia."

"Osservazioni Meteorologiche—1906—nell' Osservatorio—di Venezia."

*Meteorological Office,  
4th July 1908.*

## INDEX.

	Page		Page
Abate, Sacca dell' . . . . .	80	A. Konstantino islet . . . . .	351
Abatuta islets . . . . .	170	Akrata point . . . . .	357
Abbazia, port . . . . .	131	Akri bank . . . . .	297
———, light . . . . .	131	—— point . . . . .	295
Abelike bay . . . . .	306	—— tower . . . . .	295
Abruzzi . . . . .	63	Akroteri, cape . . . . .	326
Abruzzo coast . . . . .	3	—— shoals . . . . .	326
———, current . . . . .	22	———, clearing marks . . . . .	326
Absorus . . . . .	138	——— tower . . . . .	326
Achelous . . . . .	318	Albanese rock . . . . .	258
Acheron . . . . .	279	Albani tower . . . . .	72
Acherusia . . . . .	278	Albania coast . . . . .	4, 250, 270
Achiloo islet or rock . . . . .	302	———, aspect . . . . .	250, 271
Acritas . . . . .	367	———, currents . . . . .	271
Acro-Corinthus . . . . .	354	———, navigation of . . . . .	24
Acropolis; Corinth . . . . .	354	———, winds . . . . .	270
———; Patras . . . . .	344	——— province . . . . .	263
Actium . . . . .	294	Albatross rock . . . . .	249
Adamich mole . . . . .	133	Alberoni, fort . . . . .	85, 90
———, light . . . . .	134	——— spit . . . . .	90
A. Demetrios island . . . . .	350	Albius . . . . .	204
Aderico rocks . . . . .	62	Albona town . . . . .	130
Adige river . . . . .	83	Alessandria islet . . . . .	225
Adria . . . . .	1, 82	Alessio . . . . .	264
Adriatic sea . . . . .	1	Aliki, lake . . . . .	358
———, Basin of the . . . . .	2	——, port . . . . .	353
———, coast . . . . .	2	Alilas bay . . . . .	335
———, colour . . . . .	2	Alimini bay . . . . .	40
———, communication . . . . .	7	——, lake . . . . .	40
———, currents . . . . .	17, 22	Alipa port . . . . .	286
———, eastern shore . . . . .	3, 97	Almissa road . . . . .	202
———, extent . . . . .	1	———, lights . . . . .	203
———, gulfs . . . . .	6	——— town . . . . .	203
———, islands . . . . .	6	Almura, lake . . . . .	274
———, mountains . . . . .	3	Alpheus . . . . .	361
———, navigation of . . . . .	23-34	Alps . . . . .	2
———, soundings . . . . .	4	Alyzia, port . . . . .	309
———, south-east-ward of . . . . .	5	Amaxiki . . . . .	303
———, tides . . . . .	22	Ambelos islet . . . . .	352
———, western shore . . . . .	2, 37	Ambolizza shoal . . . . .	112
———, winds and weather . . . . .	10-17	———, beacon . . . . .	112
Ægion . . . . .	357	Ambracia . . . . .	301
Ægosthena . . . . .	353	Ambrakia, lake . . . . .	299
Ænona town . . . . .	165	Ambrakikos . . . . .	294
Ænos mount . . . . .	319	Amphissa . . . . .	351
Aggi Yanni islet . . . . .	338	Amphitheatre; Pola . . . . .	123
Agia, mount . . . . .	362, 364	Amydros, mount . . . . .	298
A. Giorgios islet . . . . .	350	Anatoliko, lake . . . . .	341
Agnuli punta, light . . . . .	56	——— town . . . . .	341
Agram . . . . .	135	Anchorage regulations for Foreign vessels . . . . .	9
Agrilios point . . . . .	323	Ancina tower . . . . .	48
Agriossiko bluff . . . . .	320	Ancona . . . . .	68
Agulinitza lake . . . . .	361	——, coal . . . . .	69
Aio Nisi islet . . . . .	276	——, currents near . . . . .	22, 71
——— promontory . . . . .	277	——, depths . . . . .	69
Aitos, mount . . . . .	322	——, directions . . . . .	71

	Page		Page
Ancona, harbour -	69	Arat point, light -	159
———, beacon -	70	Araxos promontory -	342
———, hospital -	69	Arbe island -	152
———, lights -	70	———, anchorages -	153
———, meteorological table -	374	———, light -	155
———, mount -	67	———, telegraph cables -	152
———, point -	68	———, port -	152
———, railway -	68	———, directions -	153
———, repairs -	69	———, lights -	153
———, road -	70	Arbit point -	140
———, semaphore -	70	———, shoal, beacon -	140
———, supplies -	69	Arcadia gulf -	7, 361
———, trade -	69	———, soundings off -	5
———, wireless telegraph -	70	———, water -	361
———, to Trieste -	33	———, mountains of -	369
———, Venice -	32	———, town -	361
———, Zara -	29	Ardizza, mount -	71, 73
Andi-Samos bay -	22	Arena point -	46
Andrano, port -	38	Arethusa fountain -	323
Andrea point -	332	Argostoli -	324-329
———, light -	332	———, anchorage -	328
Andreis town -	187	———, aspect -	324
Andric, prohibited anchorage -	252	———, coal -	328
———, telegraph cable -	256	———, depths -	324
Andromache, cape -	349	———, directions -	328, 329
———, port -	349	———, harbour -	328
———, shoal -	349	———, lights -	325, 327
Anfora, port -	97	———, port -	324
———, river -	97	———, supplies -	328
Ankovica shoal -	234	———, town -	328
Annunziata point -	140	———, trade -	328
———, light -	140	Ariano village -	80
Anoge, mount -	331	Ariello river, tower -	63
Anti Kyrra bay -	352	Arilla bay -	278
———, Paxos island -	290	———, cape -	287
———, light -	290	———, village -	278
———, soundings near -	290	Arkudi island -	306
———, Rhion point -	342	Armareda bay -	272
———, light -	342	Arminium -	74
Antibarum -	261	Armyro bay, Kalamata -	371
Antivari roads -	260	———, Kervasara -	300
———, lights -	261	———, village -	371
———, stay of warships for -		Arnatzi rock -	367
———, bidden -	261	Arpizsa bay -	277
———, telegraph -	261	Arsa channel -	129
———, town -	261	———, light -	130
———, railway -	261	———, river -	129
———, winds -	261	Arta city -	301
———, wireless telegraph -	261	———, gulf of -	294, 297
A. Panagia -	350	———, East coast -	300
A. Pandocrato domes -	344	———, North coast -	300
Apasa island -	314	———, South coast -	297
A. Pedalo towers -	344	———, tides -	23
Apennines -	3, 54, 76	———, island -	179
Aphales bay -	331	———, point, light; Eso -	174
———, telegraph cable -	331	———, river -	300
Aphteli bay -	305	———, light -	301
Apollonia -	262	Artatorre cove -	140
Aprau bay -	281	Artic point -	176
Apsiphia islet -	350	Artzi bay -	372
———, light -	350	Arza point -	251
Aquila town -	63	Arzen river -	265
Aquilea -	2, 97	Ascoli -	46
———, steeple -	98	Asine castle -	368
Aractus -	300	Asinello island -	143
Araklo point, light -	301	Asino, fort -	138
Arapí hamlet -	300	———, islet; port Manzo -	159

	Page		Page
Asino islet ; Rovigno	116	Baltic	46
— shoal, beacon	116	Bandon bay	180
Aso river	66	Banic chapel	252
Asola river	67	Barbara church	98
Aspra Spitia bay	352	— point	282
—, telegraph	352	Barbaran islet	113
— village	352	—, light	113
Aspro Gali, cape	310	Barbariga point	116, 118
— Potamo river	318	Barbaros point	232
—, bar, clearing		Barbato	152
—, mark	318	— channel	153
—, delta	316	—, directions	154
Asso, fort	330	Barbaut point	267
— port	330	Barcaglione, mount	71
— village	330	Barchetta rock	282
Astacos	309	Barcola, light	100
Astagno, mount	68	Bardet shoal, buoy	42
Astiglia	82	Bari, port	49
Astokos, anchorage	314	—, anchorage	51
—, communication	314	—, coal	50
—, telegraph	314	—, communication	50
—, town	314	—, lights	50
—, trade	315	—, semaphore	49
—, supplies	314	—, tides	23
Astorga islet	116	—, trade	50
Astrakari point	287	—, wireless telegraph	49
— shoal	287	— province	54
—, clearing mark	287	— town	49
Aterra, cape	330	Baricev islet	169
—, port	330	Barium	49
Athamania province	301	Barletta	52
Atheni, port	306	—, buoy north-east of	53
Athens, gulf of	353	— harbour	53
—, telegraph cable	354	—, depths	53
—, time (standard)	9, 281	—, lights	53
Atoko island	311, 332	— road	54
Atri church	64	— salt marshes	54
Aulon	268	—, supplies	53
Auro point	21, 116	—, tides	23
Ausa river	97	Barometer	11
Australia	46	Baseleghe, port	95
Austrian frontier	96, 261	Basiliki bay	342
—, time, standard	9	Baskavoda cove	203
Avgo peak	357	Baskerat point	232
— rocks	367	Bassano	83
Avlaki point	289	Bassolini point	13
		Battery point	168
Babac island	178	Bavkul islet	183
—, light	179	Beachy head	285
Bacchante flats	275	Beccaria shoal, beacon	113
Bacili islets ; Grossa	158, 168	Beli hrt point	191
— ; Torcola	215	Bellaria	75
—, current near	215	Bello, mount	100
Badanj islet	237	Belluno	83
Badia convent	227	Belo islet	174
— islet	226	Belvedere point	170
—, port	226	Benizza village	284
—, beacons	226	Benvegnuta shoal, beacon	113
—, directions	227	Beretta rock	231
— rock, beacon	227	Berghofer shoal	181
Badisco, port	38	Bergudi harbour	133
Bado, port	129	—, floating targets	133
Bagnole islet	116	—, light	133
Balim bay	299	Berguglie bay	157
Balkun islet ; Kluda	194	—, directions	159
— ; Solta	200	—, light	158
— ; Zuri	182	Berlin, railway to	101

	Page		Page
Berna, port . . . . .	231	Bolana bay . . . . .	282
Bernazza point . . . . .	111	Bologna . . . . .	46, 68, 77
Berstjak islet . . . . .	158	Bombay . . . . .	103
Bertinoro town . . . . .	78	Bombista, mount . . . . .	124
Bescanuova bay . . . . .	150	Bonaster point . . . . .	158
—— town, light . . . . .	150	—— rock . . . . .	158
Betina, light . . . . .	181	Bondenegritto shoal . . . . .	147
Bevano bay, anchorage . . . . .	77	“ Boot ” of Italy . . . . .	37
—— tower . . . . .	77	Bora cove . . . . .	176
Bhars fort . . . . .	272	—— wind . . . . .	11-14
Biaka point, light . . . . .	205	Borak, mount . . . . .	203
Bianca point . . . . .	138	Bordeaux . . . . .	46
Bianche point . . . . .	168	Borino . . . . .	13
——, light . . . . .	168	Borovac islet . . . . .	238
Bianco canal . . . . .	82	Borovnjak point . . . . .	175
——, cape; Brindisi . . . . .	43	Borsi, fort . . . . .	272
——; Corfu . . . . .	285	Bosnia . . . . .	189, 199
—— telegraph cables . . . . .	281, 285	Bosnian frontier . . . . .	203
——, port . . . . .	80	Bossiljina bay . . . . .	195
—— shoal . . . . .	285	——, anchorage . . . . .	195
Bibinje . . . . .	178	——, directions . . . . .	196
Bice island . . . . .	184	Botticella bank, buoys . . . . .	199
——, light . . . . .	184	—— point . . . . .	199
Biclaz islet . . . . .	232	—— rock; Morter bay . . . . .	181
Biferno river . . . . .	61	——; Zuri, north-west . . . . .	172, 182
Bila point . . . . .	224	Bracis islet . . . . .	156
Bilibrach shoal . . . . .	154	Bragonitica shoal . . . . .	286
Biokovo, mount . . . . .	204	Brancorso, cape . . . . .	123
Bisaza islet . . . . .	227	Bratin Otok . . . . .	233
Bisceglie, port . . . . .	52	Bratinottok islet . . . . .	233
Bisse islet . . . . .	124	Brazza channel . . . . .	27, 207
Bistrina bay . . . . .	211	——, current . . . . .	207
Bjelevica bay . . . . .	211	——, shoals . . . . .	207
Blaca bay . . . . .	210	—— island . . . . .	204-207
—— point . . . . .	208	——, lights . . . . .	205, 206
——, light . . . . .	208, 211	——, telegraph cables . . . . .	204
—— rocks . . . . .	228	Brela village . . . . .	203
Black hill . . . . .	299	Breno bay . . . . .	247
—— mountain . . . . .	319	——, directions . . . . .	247
—— Sea . . . . .	101	—— valley . . . . .	247
—— ports . . . . .	46	Brenta river . . . . .	83
Blatta town . . . . .	230	Brevilacqua strait . . . . .	164
Blue grotto of Busi . . . . .	221	——, anchorage . . . . .	164
Bobara islet . . . . .	248	Brguisi islet . . . . .	157
Bobovisce cove . . . . .	205	Briesta bay . . . . .	208
Bocca Falsa; Jaklian . . . . .	239	——, lights . . . . .	208
——; Lussin . . . . .	140	—— village, church . . . . .	208
—— Grande; Calamota . . . . .	241	Brindisi . . . . .	41-47
——; Lussin . . . . .	139	——, buoys . . . . .	42, 43
—— Inganatore . . . . .	238	——, coal . . . . .	46
—— di Pago . . . . .	161	——, communication . . . . .	46
—— Segna . . . . .	30, 150	——, dangers . . . . .	43
Bocha point . . . . .	288	——, depths . . . . .	41
Bodok, port . . . . .	185	——, directions . . . . .	44, 45
Boiano . . . . .	61	——, harbours . . . . .	42
Bojana anchorage . . . . .	263	——, lights . . . . .	43, 44
—— river . . . . .	262	——, mooring buoys . . . . .	43
——, current . . . . .	262	——, patent slips, repairs . . . . .	47
——, depths . . . . .	263	——, railway . . . . .	46
——, pilots . . . . .	263	——, roads . . . . .	41, 42
——, pratique . . . . .	263	——, semaphores . . . . .	47
——, supplies . . . . .	263	——, tides . . . . .	23
——, telegraph . . . . .	263	—— town . . . . .	45
Bol . . . . .	206	——, trade . . . . .	46
——, light . . . . .	206	Brioni islands . . . . .	117
——, telegraph cable . . . . .	204	——, anchorage . . . . .	118
—— village . . . . .	206		

	Page		Page
Brioni islands, directions	119	Caleri, port	82
-----, lights	118	Calogera islet	174
-----, telegraph	118	Calovero islet	284
----- village	117	Calvano river	64
Brizine point	179	Calvario, mount	138
Broce, light	242	Calvo, mount	55
Brondolo, port	83	Calydon bay	341
Brundusium	45	Camera, port	238
Brusnik islet	222	Camisa bay	138
Brusnjak islet	163	Campanile shoal	115
Bua island	195	Campi bay	106
-----, light	196	----- islet	56
Buc island	170	----- tower	56
Buccari bay	135	Campomarino village	61
-----, lights	135	Canalazzo	87
----- point	285	Canale Castelli	197
----- town	135	-----, directions	198
Buccarizza bay	135	-----, light	197
----- village	135	----- di Leme	114
Buda-Pesth	132	----- Riccioni, light	74
Budim peak	166	Candelaro river	54
Budina cove	242	Caneve cove	146
Budua church	259	Canidole islands	141
-----, port	259	-----, anchorage	141
-----, buoys	259	-----, channel north of	141
-----, lights	259, 260	Canne tower	47
-----, telegraph	259	Cantafoico point	244
Bughat village	298	-----, light	245
Bukari point	341	Cantarara rocks	154
-----, clearing marks	341	Caorle church, light	94
Bukavac, mount	16	----- town	94
Bumisto, mount	309	Capitanata province	54
Buoyage, explanation of	35	Capo d'Istria bay	106
Burano	92	----- town	106
Busa del Bastimento	79	-----, light	106
----- della Pila	79	-----, water	106
Busi, blue grotto of	221	Capočesto church	189
----- island	221	-----, islets	190
Buso, port	97	-----, light	190
-----, light	97	-----, port	190
But shoal	147	-----, telegraph	190
Butrinto bay	274	----- village	190
----- lake	274	Capojale point	60
----- river	274	Cappellata point	145
		Cappuccini, mount	70
		-----, light	70
		-----, semaphore station	70
		-----, wireless telegraph	70
Cabula shoal	117	Caprara island	58
-----, light	118	-----, light	59
Cacoja inlet	124	Caprarella	42
Caia mountain	72	Capuchin, mount	78
Caisole cove	145	Carapella river	54
Cajola rock	60	Caravanche railway	101
Cal, mount	100	Carbarus islet	138
Cala dell' acqua viva	38	Carboni, port	230
----- Kaka	272	-----, directions	230
Calaja church	267	Carlo Glosa point	315
Calalunga tower	57	-----, beacon	315
Calamotta channel	238	Carltonisi island	313
-----, anchorage	25, 243	Carlopago	166
-----, directions	245	-----, light	166
----- island	240	Carlstadt	132
----- strait	240	Carniola mountains	2
Calbula islet	42	Carnizza, port	129
----- shoal, buoy	112	Carnosa tower	49
Calcutta	103	Carober, port	220
Caldero, monte	128		
Caldonte anchorage	144		

	Page		Page
Caroman, fort . . . . .	83	Cattaro, town, anchorage off . . . . .	257
Carovie, mount . . . . .	223	———, light . . . . .	257
Carovigno town . . . . .	47	———, mooring buoys . . . . .	257
Carpegna mountains . . . . .	75	———, supplies . . . . .	257
Casa Verona . . . . .	252	Cattolica . . . . .	74
——— Wassermann . . . . .	121	———, light . . . . .	74
Cascina Arisciano . . . . .	52	Cavalika point . . . . .	240
Casone river . . . . .	64	——— shoal, buoy . . . . .	241
Cassion bay . . . . .	147	Cavallo, cape . . . . .	41
———, lights . . . . .	147	———, clearing marks . . . . .	43
Cassone, port . . . . .	246	——— rock . . . . .	43
———, lights . . . . .	246	——— tower . . . . .	45
Cassopetto, port . . . . .	281	Cavanella passage . . . . .	138
Cassopo point . . . . .	281	———, light . . . . .	144
Castagneda point . . . . .	112	Cavata islet . . . . .	179
Castalian spring . . . . .	349	———, light . . . . .	179
Castel di Mezzo, light . . . . .	74	Cavlena bay . . . . .	147
——— Vecchio . . . . .	197	Cavlin islet . . . . .	184
———, shoal, beacon . . . . .	197	———, danger west-north-west of . . . . .	184
Castello, anchorage . . . . .	126	Cazza channel . . . . .	26
——— di Trani . . . . .	52	——— islet . . . . .	231
——— islet . . . . .	42	———, light . . . . .	231
——— point, beacon . . . . .	126	Cazziol islet . . . . .	231
Castelmuschio bay . . . . .	148	Celano lake . . . . .	62
Castelnuovo; Canale Castelli . . . . .	197	Celini rock . . . . .	195
———, light . . . . .	197	Cephalonia . . . . .	319
———, Cattaro . . . . .	253	———, climate . . . . .	320
———, light . . . . .	253	———, coal . . . . .	328
———, prohibited anchorage . . . . .	252	———, communication . . . . .	320
———, railway . . . . .	253	———, population . . . . .	320
———, telegraph . . . . .	253	———, quarantine . . . . .	320
———, town . . . . .	253	———, soundings near . . . . .	5
Castelvechio . . . . .	129	———, telegraph cables . . . . .	320
Castle hill . . . . .	335	Cereria point, buoy . . . . .	176
Castro, port . . . . .	38	Cerkalije cove . . . . .	203
Castua town . . . . .	131	Cerkviea islet . . . . .	239
Cataleo, cape . . . . .	323	Cerna Seka islet . . . . .	236
———, telegraph cable . . . . .	323	Cernac islet . . . . .	232
——— village . . . . .	323	Cernica bay . . . . .	154
Catene channel . . . . .	255	Cerrano river . . . . .	64
———, current . . . . .	255	——— tower . . . . .	64
———, lights . . . . .	255	Certosa, la . . . . .	92
———, prohibited anchorage . . . . .	252	Cervera, port . . . . .	111
———, telegraph cables . . . . .	255	Cervia . . . . .	65
Catria mountain . . . . .	72, 73	———, port . . . . .	76
Cattaro, gulf of . . . . .	250, 256	———, light . . . . .	76
———, approaching . . . . .	255	Cervignano village . . . . .	97
———, aspect . . . . .	251	Cesano river . . . . .	72
———, coal . . . . .	254	Cesana town . . . . .	76
———, current . . . . .	251	Cesenatico . . . . .	75
———, directions . . . . .	252, 257, 258	———, fog signal . . . . .	76
———, eastern basin . . . . .	256	———, lights . . . . .	76
———, entrance . . . . .	262	Cesvenica islet . . . . .	234
———, lights . . . . .	251, 253, 257	Cetina river . . . . .	203
———, making the land . . . . .	251	Cette . . . . .	46
———, middle basin . . . . .	254	Cettegni . . . . .	257
———, navigation of . . . . .	25	Chakolonisi . . . . .	313
———, prohibited anchorage . . . . .	252	Chalcis ruins . . . . .	342
———, signal station . . . . .	251	Chapel islet . . . . .	371
———, submarine mining . . . . .	252	Charadrus . . . . .	300
———, ground . . . . .	252	Chelovero harbour . . . . .	302
———, telegraph cables . . . . .	251	Chelonites . . . . .	359
———, western basin, an- . . . . .	252	Chersine point, beacons . . . . .	124
———, chorage . . . . .	252	Cherso bay . . . . .	136
———, winds . . . . .	251	——— island . . . . .	135
———, port . . . . .	257	———, east coast . . . . .	145
———, town . . . . .	256	———, telegraph cables . . . . .	136

	Page		Page
Cherso island, west coast	135	Climate, Nona	165
——, port	136	——, Pago island	161
——, lights	137	——, Patras	345
——, telegraph	137	——, Pola	120
—— town	137	——, Santa Maura	303
Chianea tower	41	——, Stagno	241
Chiave bay	212	——, Trau	196
——, telegraph cables	204, 212	——, Trieste	100
——, port; Lagosta	233	——, Venetian coast	82
——; Meleda	238	——, Vliko	308
Chienti river	67	Coal supplies, general	35
Chieti steeple	63	——, Ancona	69
Chilone, mount	61	——, Argostoli	328
China	46	——, Bari	50
Chinkin, port	264	——, Barletta	53
Chioggia, port	83	——, Brindisi	48
——, depths	83	——, Cattaro	254
——, directions	84	——, Cephalonia	328
——, lights	84	——, Corfu	283
——, spoil buoy off	84	——, Fiume	132
——, tides	84	——, Gravosa	245
Chiuse canal	72	——, Kumbor	254
Christo point	120	——, Lissa	220
Cielo islet	126	——, Malamocco	86
——, beacon	126	——, Methovic	210
Cigale point	140	——, Monopoli	48
——, port	140	——, Parenzo	113
——, light	140	——, Patras	344
Cika mount	272	——, Pirano	107
—— mountains	272	——, Pola	123
Cima islet	238	——, Ragusa	246
—— di Melida, port	238	——, Rovigno	116
Cinca point	229	——, Sebenico	189
Cindola tower	47	——, Spalato	200
Citadel islet	290	——, Trieste	104
—— light; Corfu	284	——, Venice	89
Cittanuova	110	——, Zante	337
——, beacon	110	——, Zara	177
——, buoy	110	Coast of Adriatic	2, 97
——, directions	110	—— Albania	4
——, lifeboat	110	—— Greece	4
——, light	110	—— Istria	104
——, telegraph	110	——, anchorage	105
Citta Vecchia bay	213	Cacytus	279
——, light	213	Cadigoro	80
——, telegraph	213	Colombo	103
——, town	213	Colonella town	64
Civitanuova, port, town	67	Colonne, la	106
Civran shoal	112	Comacchio lagoon	78
——, buoy	112	—— town	78
Clemente island	216	Comeni head	283
Climate, general remarks on	10	Comisa bay	27, 220
——, Almissa	230	——, directions	220
——, Arcadia, gulf of	361	——, light	220
——, Argostoli	328	——, port	220
——, Arta, gulf of	300	—— town	220
——, Barletta	52, 54	——, telegraph	220
——, Brindisi	46	——, wireless telegraph	220
——, Capo d' Istria	106	station (proposed)	220
——, Cephalonia	320	Communication, general	7
——, Corfu	283	Comna, lake	168
——, Govino	283	Compare, cape	120
——, Ionia	271	——, light	121
——, Istria	104	——, light-buoy off	121
——, Kalamata	370	——, fort	123
——, Missolonghi	341	Conca river	74
——, Narenta valley	209	—— tower	74

	Page		Page
Conera, mount . . . . .	67, 71	Corno, mount . . . . .	3, 64
—, anchorage off . . . . .	68	Corone . . . . .	369
—, telegraph tower . . . . .	67	Corsia channel . . . . .	147
Constantinople . . . . .	46, 295	Corsini canal . . . . .	77
Consular station . . . . .	36	—, port . . . . .	77
Contarina village . . . . .	82	—, directions . . . . .	78
Contrada del Fontanone . . . . .	101	—, fog signal . . . . .	77
Conversada shoal . . . . .	115	—, lights . . . . .	77
Cope, mount . . . . .	123	—, semaphore . . . . .	78
—, beacons . . . . .	124	—, tidal signals . . . . .	78
Corcyra Nigra . . . . .	228	Cortellazzo bank . . . . .	91
Corfu island . . . . .	280-293	—, port . . . . .	93
—, approach . . . . .	24	Cosada isle . . . . .	119
—, communication . . . . .	281	— shoal . . . . .	119
—, currents . . . . .	293	Cossion point . . . . .	163
—, directions . . . . .	291-293	—, port . . . . .	163
—, north channel . . . . .	291	—, light . . . . .	163
—, south channel . . . . .	292	Craul point, light . . . . .	39
—, east coast . . . . .	282	Cravaris island . . . . .	314
—, lights . . . . .	284, 285, 289	Cretaccio islet . . . . .	58
—, meteorological table . . . . .	375	Crete, telegraph cable . . . . .	336
—, north coast . . . . .	287	Cristo point . . . . .	119, 122
—, population . . . . .	281, 283	Crkvenica mole, light . . . . .	149
—, quarantine . . . . .	284	Crni point . . . . .	260
—, repairs . . . . .	284	Croatia, coast of . . . . .	3, 128, 165
—, road . . . . .	284	Croce, mount della . . . . .	68
—, soundings westward of . . . . .	5	— point; Cherso . . . . .	145
—, supplies . . . . .	283	—; Leme . . . . .	115
—, telegraph cables . . . . .	281, 285	Crussia point . . . . .	147
—, trade . . . . .	281	—, light . . . . .	147
—, west coast . . . . .	286	Cucurizzo tower . . . . .	38
—, winds . . . . .	293	Cuje, port . . . . .	129
— town . . . . .	283	Culpa river . . . . .	132
—, citadel . . . . .	283	Currents . . . . .	17-22
—, light . . . . .	284	—, Adriatic . . . . .	18
—, coal . . . . .	283	—, eastern shore . . . . .	18
Corinth, ancient city . . . . .	354	—, entrance . . . . .	18
— bay . . . . .	353	—, inner channels . . . . .	19, 20
—, light . . . . .	354	—, Istrian coast . . . . .	21
—, telegraph cable . . . . .	354	—, Italian coast . . . . .	22
— canal . . . . .	354	—, outside islands . . . . .	19
—, current . . . . .	355	—, Planka point . . . . .	20
—, depths . . . . .	354	—, Quarnero, gulf of . . . . .	20
—, dimensions . . . . .	354	—, Trieste, gulf of . . . . .	21
—, directions . . . . .	355	—, Venice, gulf of . . . . .	21
—, lights . . . . .	355	—, western shore . . . . .	21
—, moles . . . . .	355	Curzola channel . . . . .	223
—, pilots . . . . .	355	—, current . . . . .	19
—, railway bridge . . . . .	355	— island . . . . .	228
—, regulations for navi- gating . . . . .	356	—, telegraph cable . . . . .	226
—, telegraph . . . . .	355	—, port . . . . .	226
—, tide . . . . .	355	— town . . . . .	226
—, gulf of . . . . .	345	—, lights . . . . .	226
—, currents . . . . .	346	Custance shoal . . . . .	312
—, directions . . . . .	347	Cutin islet . . . . .	145
—, narrows, the . . . . .	342	Cyllene ruins . . . . .	359
—, southern shore . . . . .	357	Dagh Liani marsh . . . . .	362
—, tides . . . . .	23, 346	Daila, port . . . . .	110
—, winds and weather . . . . .	345	—, bank, buoy . . . . .	110
—, isthmus of . . . . .	354	— tower . . . . .	110
— town . . . . .	354	Daksa islet . . . . .	243
—, anchorage . . . . .	354	—, light . . . . .	243
—, light . . . . .	354	Dalmatia, coast of . . . . .	3, 128, 168, 250
—, telegraph . . . . .	354	—, boundary . . . . .	168, 260
Corissa, lake . . . . .	286	—, tides . . . . .	23
Cormato islet . . . . .	147	Danisti rock . . . . .	324

	Page		Page
Dartsch river	266	Dragonera islands, southern group	314
Daskalio islet ; Aspra Spitia	352	Drasti, cape	287
— ; Kala	353	Drazamaski islet	181
Davia point	336	Drenova, mount	133
Davy bank	312	Drepano point ; Corinth gulf	347
—, clearing marks	312	—, light	347
Day rock	315	— ; Gomenizza	276
—, clearing marks	315	—, port	308
Debelo Blezevo, mount	232	Drin gulf	262
Dekalia, cape	322	—, anchorage	264
Del Gallo point, light	107	— river	264
Della Croce, mount	68	Duare castle	203
— Madonna point, light	191	Duba bay	211
Delos	284, 337, 345	— point, shoal	208
Delphi temple	349	— village	208
Demata bay	302	Dubno point	149
Dente point, light	111	—, light	149
Derana point	262	Dubovica point	250, 260
Dervenik cove	207	Dubrovica coal fields	190
— islet	188	Duga islet	184
Deskalio islet	321	— point, light	166
Devesile, mount	254	Duinka islet	187
Diakopo islet	288	—, light	187
Diaplo islet	288	Duino castle	99
Diavolo point, light	59	— cove	99
Dignano church tower	117	—, port	99
— village	119	— ; lifeboat	99
Diklo	176	—, light	99
Di Leme canal	114	Dukati, port	268
Dimitri shoal	335	Dukato, cape	304
—, buoy	335	—, light	305
Dinara mount	203	—, shoal	305
— mountains	190	Dulcigno road	262
Dinaric Alps	168	— town	262
Dingac islet	225	Dumbarca bay	171
Dinjaska bay	165	Duomo cathedral ; Spalato	198
Dioni bay	318	Durazzo bank	265
— peninsula	317	— bay	266
Distomi village	352	—, anchorage	266
Divaca	105	—, directions	266
Dobrena bay	352	—, cape	265
Dobrigno bay	149	—, lake	265
—, light	149	—, mount	266
Dobriotok islet	216	— town	266
Dobrovaska, mount	228	—, light	266
Dock accommodation	35	—, telegraph	266
Dolfin islet	155	Dyko bay	372
—, light	155	Dyrrachium	266
Doli bay	242		
Dolin island	153		
— point	153		
Dolnja point	242		
—, light	242		
Dolo	83		
Donzella rock	241		
Doozinani islet or rock	302		
—, beacon	302		
D'Ostro point	248, 250		
—, light	251		
—, telegraph cables	251		
Drace, light	208		
Dragamesti bay	314		
—, anchorage	314		
—, directions	314, 317		
Dragazul cove	142		
Dragonera island	312		
— islands	311-314		
		East bluff	342
		Eastern basin ; Cattaro	256
		Echinades islands	318
		Egnaxia point	47
		Egypt	46
		Elatia, mount	353
		Elia point	306
		Elias, mount	362
		Elis plains	359
		Engali bay	357
		Epezio	202
		Epidaurus	248
		Epirus	281
		— mountains	24
		— province	271
		Eratini bay	348
		— village	348

	Page		Page
Erbe shoal . . . . .	112	Fisella battery . . . . .	122
Ermones bay . . . . .	286	— valley . . . . .	122
Ertac point . . . . .	149	Fisolo channel . . . . .	85
—, light . . . . .	149	Fiume, anchorage . . . . .	134
Esino river . . . . .	71	—, coal . . . . .	132
Eso Grande, light . . . . .	174	—, communication . . . . .	8, 132
— island . . . . .	173	—, hospital . . . . .	132
—, telegraph cable . . . . .	173	—, lights . . . . .	133
Esopontale village . . . . .	173	—, light-vessel . . . . .	133
Etruscan colony . . . . .	1	—, moles . . . . .	133
Euphemia cove . . . . .	153	—, mooring buoys . . . . .	133
Europe . . . . .	46	—, petroleum basin . . . . .	133
Eustachio, lights . . . . .	257	—, port . . . . .	132
Evenos river . . . . .	341	—, sea-marks . . . . .	133
Ex Aito bay . . . . .	333	—, supplies . . . . .	132
		—, tides . . . . .	134
		—, time signal . . . . .	134
		—, trade . . . . .	132
Fabrizio mountains . . . . .	71	Fiumera canal . . . . .	167
Fabrica point . . . . .	215	Fiumicelli tower . . . . .	40
Faenza channel . . . . .	78	Flayva bay . . . . .	304
Fafarikulac islet . . . . .	170	Florence . . . . .	68
Falconara, mount . . . . .	71	Foggia . . . . .	52, 54
— town . . . . .	70	Foglia river . . . . .	73
Falconera, port . . . . .	94	Fogon, port . . . . .	141
Fano island . . . . .	288	Fojaga shoal . . . . .	115
—, light . . . . .	289	Foligno . . . . .	71
—, soundings near . . . . .	5	Fontane point . . . . .	114
—, supplies . . . . .	289	—, rock near, beacon . . . . .	114
—, port . . . . .	72	—, port . . . . .	113
—, lights . . . . .	73	—, shoals, beacons . . . . .	113
— town . . . . .	72	— village . . . . .	114
Farasina channel . . . . .	131	Fontanella rock . . . . .	43
— cove . . . . .	136	For shoal . . . . .	108
—, telegraph cable . . . . .	131, 136	Foraneo mole; Bari . . . . .	49
— village . . . . .	136	Foreign vessels, regulations for . . . . .	9
Fasana, canal di . . . . .	118	— anchorage . . . . .	311
— channel . . . . .	118	Formicula islet . . . . .	311
—, directions . . . . .	119	— shoal . . . . .	311
—, floating beacons . . . . .	119	—, clearing marks . . . . .	311
—, lights . . . . .	118	Foro river, tower . . . . .	63
—, mooring buoys . . . . .	119	Fort Imperial . . . . .	246
—, submarine mining . . . . .	118	— Mare . . . . .	42
— ground . . . . .	118	—, light . . . . .	44
—, harbour . . . . .	119	— Monte-Marana . . . . .	68
—, lights . . . . .	119	— Royal . . . . .	247
—, telegraph . . . . .	119	Forticcio point . . . . .	129
— village . . . . .	119	Fortino point, light . . . . .	213
Faskia, cape . . . . .	286	Fortore river . . . . .	61
Felice tower . . . . .	56	—, anchorage . . . . .	61
Felonega islet . . . . .	125	Fossone, port . . . . .	83
— shoals . . . . .	125	Francavilla village . . . . .	63
—, beacons . . . . .	125	Franz, fort . . . . .	121
Feltrino river . . . . .	62	—, light . . . . .	121
Femmina point . . . . .	118	— Joseph mole, light . . . . .	177
Fenera islet . . . . .	126	Frascher islet . . . . .	124
Ferkanjo point . . . . .	153	Frento river . . . . .	61
—, light . . . . .	153	Frentone river . . . . .	61
—, telegraph cable . . . . .	152	Frikes bay . . . . .	331
Fermo town . . . . .	66	—, port . . . . .	331
Ferrara, port . . . . .	79	— village . . . . .	332
Fianona bay . . . . .	130	Friuli coast . . . . .	97
— village . . . . .	130	— mountains . . . . .	95
—, supplies . . . . .	131	— plains . . . . .	5
Figarola bank . . . . .	115	Fronte, cape . . . . .	155
— islands . . . . .	115	—, light . . . . .	155
Filippos island . . . . .	313	Ftelia, port . . . . .	274
Fiorenzuola, mount . . . . .	73		

	Page		Page
Fucin rocks - - - -	160	Gheladha, cape - - -	298
Fusina - - - -	88	Ghermano, port - - -	353
		Ghereghambo, cape - -	329
		_____ , light - - -	329
Gabice village - - -	74	Ghgnat, mount - - -	203
Gabriel Baross harbour -	133	Gibraltar - - -	46
_____ , light - - -	134	Ginpana island - - -	238
Gagliano village - - -	38	Ginseppina mole, light -	103
Gaja point - - - -	162	Giove, mount - - -	73
Galaxidi channels - - -	349	Giovinazzo town - - -	51
_____ islets - - -	349	Girolamo island - - -	118
_____ , port - - -	349	_____ islet - - -	216
_____ , directions -	350	Giudecca channel - - -	88
_____ , light - - -	351	Giuliana bay - - -	225
_____ shoals - - -	350	_____ , lights - - -	225
_____ town - - -	349	_____ valley - - -	26, 223
Galera islet - - -	197	_____ village - - -	223
_____ , beacon - - -	197	Giuppana island - - -	239
_____ rock - - -	194	_____ , telegraph cable -	240
_____ , light - - -	195	Giuseppe, anchorage -	206
Galere mole, light - -	106	Giuseppina mole - - -	101
Galesniak island - - -	178	_____ , light - - -	103
Galica islet - - -	236	Gjenovic point, beacon -	254
Galicak hill - - -	210	_____ , light - - -	254
Galiner islet - - -	114	_____ village - - -	254
Galiola isle - - -	141	Glarenza, cape - - -	358
_____ , fog signal - -	141	_____ , anchorage - -	359
_____ , light - - -	141	_____ , light - - -	359
_____ islet - - -	169	_____ village - - -	359
Galisnik islet - - -	215	Glavat islet ; Lagostini -	235
_____ , light - - -	215	_____ , light - - -	235
Gallia islet - - -	117	_____ ; Meleda - - -	236
Gallie, mount - - -	124	Glavica point ; Karober -	201
Gallipoli, port - - -	46	_____ , light - - -	201
Gallo, cape ; Brindisi -	41	_____ ; Verboska - - -	213
_____ , light - - -	44	Glavina bank - - -	154, 165
_____ , spoil buoy off -	43	_____ , beacon - - -	154
_____ ; Morea - - -	367	_____ point - - -	154
Gangaro islet - - -	175	Glipha bay - - -	350
Garbe, mount - - -	142	Gliuta rivulet - - -	247
_____ , light - - -	142	Glosa Ovrias - - -	317
Garden island - - -	88, 91	_____ Pogonias point -	315
Gargano head - - -	56	_____ shoal - - -	315
_____ , current - - -	22	_____ , clearing marks -	315
_____ , mount - - -	55	Glossa point - - -	359
_____ peninsula - - -	56	Glycys - - -	279
Galovez point - - -	268	Gobbo shoal - - -	108
Garmina point - - -	185	Gojak islet ; Briesta -	208
Garofolin rock, beacon -	153	_____ ; Sestrice - - -	227
Garuna mountain - - -	286	Gojca islet - - -	217
Gastuni river - - -	360	Golac islet - - -	158
Gattarella tower - - -	56	Gole-vrch peak - - -	166
Gayo, port - - -	290	Goli islet - - -	152
_____ , light - - -	290	_____ rat point - - -	236
_____ town - - -	289, 290	Golobinka point - - -	258
Gelsa, port - - -	213	Goly, mount - - -	130
_____ , light - - -	214	Gomaros bay - - -	280
_____ , telegraph - - -	214	Gomena, cape - - -	207
_____ village - - -	214	_____ , light - - -	208
General remarks - - -	1	_____ , telegraph cable -	208
Genoise castle - - -	45	_____ point - - -	208
Geraneia, mount - - -	353	Gomenizza, port - - -	276
Germinjak islets - - -	170	_____ , directions - -	276
Gerolimena - - -	372	Gorcik islet - - -	228
_____ , light - - -	372	Gordi islets - - -	286
Gerska anchorage - - -	206	Gorino village - - -	80
Gessaro, lake - - -	129	Gornl Gora, mount - - -	260

	Page		Page
Gornja point	242	Grossa point ; Malauka	260
Goro point, light	81	Grosso, cape	372
— road	80	— point ; Agrilios	323
— village	80	— ; Pola	122
Govino, port	283	Grottamare village	66
Gozdenjak islet	169	Grucia bank	143
Gradac village	209	— islet	143, 155
—, light	209	—, light	144
Gradara hills	74	Gruj peninsula	238
Gradaz, port	129	— point	238
Gradisca point	231	Guasco, mount	67
—, light	231	Gubessa islet ; Carboni	230
Grado lagoon	82	— ; Villagrande	229
— lagoons	82, 94	Gudbovac islet	227
— port	97	Guidronisi islet	297
—, lights	98	Guiscardo bay	321
—, telegraph cable	98	— point	321
— steeple	97	—, light	321
— village	97	Gulf of Arcadia	361
Gran Sasso D'Italia	3, 64	— Arta	294, 297
Grand canal ; Venice	87	— Cattaro	250, 256
Grande bay (Vallegrande)	229	— Corinth	345
—, mount	174	— Drin	262
— Pelagosa isle	59	— Kalamata	367
—, Porto	223	— Krissa	349
Grant bank	312	— Medolino	126
—, clearing marks	312	—, directions	126
Grava bay	273	— Patras	339
— village	276	— Prevesa	296
Gravosa, port	244	— Salona	349
—, anchorage	244	Gulfs of the Adriatic	6
—, buoys and beacons	245	Guri Geranis islet	262
—, directions	246	Gurla river	279
—, lifeboat	245	Gyphlissa point	357
—, lights	245		
—, supplies	245	Hadria	1
Great Arta island	180	Hancock rock	347
— Canidole island	141	Harbour castle ; Pola	121
— Figarola island	115	Harpy islet	338
— Molonta bay	249	Helicon, mount	352
— Oriole islet	144	Herzegovina	209
— Palermo	212	—, railway	8
— Proversa channel	170	Hieroniti shoals	307
— Quarnero channel	30, 142	—, clearing mark	307
—, current	20, 143	Hieronisi islet	277
—, winds	12	Hilda bay	275
— Stagno channel	241	— islets	275
— Zirona island	194	H. Ioyannis island	348
Guben islet	218	Hochgrund	164
Greco de Lesina channel	212	Hodilje village	212
—, current	213	Hom, mount	26, 229
Gredica rock	230	Hong Kong	103
Greece, coast of	4	Hoste island	219
Greek frontier	294	—, lights	219
Grego Morte cove, telegraph cable	136, 146	Hramina, light	181
Gregorio islet	152	Hrbosnjak islet, light	183
Grgovac islet	191	Hum, mount ; Lagosta	232
Grignano bay	100	— ; Lissa	26, 218
Grisni muli	160	Humpback shoal	108
Grisons Alps	79	Hungary	132
Grombolura island	353	Hydruntum	39
Gronghera islet	117	Hylætus	346
Grossa island	168		
—, light	168	Iali bay	372
— point ; Istria	106	Iane river	369
—, buoy	106	Ieraki, cape	337
—, measured mile	106		

	Page		Page
Iganni point	333	Jefti islet, reef	302
Igrane, telegraph cable	212	Jelinac point	195
Ika, port	131	Jezera clock tower	182
——, lights	131	Jezuviza channel	226
Il Lido island	85	Jove point	197
— Trave rocks	68	Jsmi river	262
Ilino brdo, mount	249	Julian Alps	100, 132
Illyria mountains	2		
Illyrian islands	174	Kabal point	213
Imbatto wind	270	Kabas village	242
Imola	77	Kabbo point	330
Imperial, fort	246	Kaiffa lake	361
Incoronata island	171	Kaio, port	372
——, directions	171	Kakan island	183
India	46	—— rock	183
Indermur river	97	Kakascala, mount	341
Inganatore, port	238	Kakata, cape	330
Ionian islands	6	Kakova shoal	323
—— sea, soundings	5	——, clearing marks	323
Ischin	265	Kakovuni, mount	368
Ischitella church	57	Kala islands	353
Isudar	263	—— islet	353
Isola	106	Kalafati reefs	326
——, light	107	——, buoy	326
Isonzato river	98	Kalamai, gulf of	367
Isonzo river	98	Kalamaki	354
Isthmia town	355	—— bay	355
——, light	355	——, current	355
Isto island	156	Kalamata, anchorage	370
——, telegraph cable	157	——, aspect	367
—— village	156	——, communication	370
Istria, coast of	3, 104	——, directions	370
——, anchorage	105	——, gulf of	367
——, current	21	——, winds and weather	368
——, eastern coast of	128	—— harbour	370
——, shore, anchorage	85	——, lights	370
Italian coast, current	22	——, supplies	370
—— frontier	96	—— town	370
—— time (standard)	9	Kalamo river	275
Itea church	350	—— village	301
——, port	350	Kalamurto islet	340
——, directions	351	Kalavrita mole	343
——, light	351	Kale, port	174
—— town	351	Kalebinjak islet	192
Ithaca channel	320	Kaleroo rock	339
——, east shore	322	Kaliki point	298
——, directions	321	Kalikiopulo, lake	284
——, lights	321, 322	Kaliora islet	365
——, western shore	320	Kalkonisi islet	291
—— island	331	Kalogria, lake	342
——, telegraph cables	331	Kalomo island	310
Ittisa reef	280	——, mount	310
		—— town	310
Jablanaz bay	165	——, anchorage	310
——, lights	166	Kaloyeros islet	312
Jadera town	177	Kamariki	361
Jadria point	188	Kamenari, prohibited anchorage	252
——, light	188	—— village, telegraph cable	256
Jaja point	201	Kamenjak islet ; Badia	226
Jaklian island	239	—— ; Lutostrak	156
Jalova river	363	—— ; Settebocche	158
Janina	295	—— ; Vallegrande	229
Janska cove	242	Kamicic islet ; Oliveto	200
Japan	46	—— ; Pasman, south-east	
Jasi bay	259	—— end	176, 180
—— point	259	Kamik islet	221

	Page		Page
Kamilafka - - - - -	309	Kerknata islet - - - - -	170
Kampora bay - - - - -	154	Kerkyra - - - - -	283
Kanali village - - - - -	280	Kervasara bay - - - - -	299
Kandili, mount - - - - -	309	——, light - - - - -	300
Kanina castle - - - - -	268	—— village - - - - -	293
Kapri, cape - - - - -	323	Kiac point - - - - -	148
—— island - - - - -	184	Kiapro town - - - - -	273
—— port - - - - -	184	Kiephali, cape ; Epirus - - - - -	281
Karagol point - - - - -	282	—— ; Palermo - - - - -	273
—— port - - - - -	282	Kieri bay - - - - -	338
Karantunic rock, light - - - - -	174	——, pitch wells - - - - -	334
Karavastasi bay - - - - -	342	——, mount - - - - -	338
Karavi islet - - - - -	372	——, port - - - - -	338
—— rock - - - - -	288	Kioni, port - - - - -	332
Kardamilli port - - - - -	371	Kiore peak - - - - -	272
——, light - - - - -	371	Kipula point - - - - -	372
Kardiki point - - - - -	286	Kiseli bay - - - - -	348
Karknjase islet - - - - -	201	Kisternes hills - - - - -	373
Karober cove - - - - -	200	—— point - - - - -	373
——, light - - - - -	201	Kithaeron - - - - -	353
Karsee point - - - - -	365	Kithro island - - - - -	306
Kassidis islet - - - - -	352	Kitries bay - - - - -	371
Kastrades - - - - -	283	——, cape - - - - -	371
—— bay - - - - -	284	——, light - - - - -	371
Kastri point ; Fano - - - - -	288	Kiveri peak - - - - -	352
——, light - - - - -	289	Klek bay - - - - -	211
—— ; Skropio - - - - -	307	——, directions - - - - -	211
—— town - - - - -	349	——, lights - - - - -	211
Kastro Tornese - - - - -	359	——, telegraph - - - - -	211
Kastrosikia point - - - - -	280	—— point - - - - -	211
Kastus island - - - - -	310	Klemutzi village - - - - -	359
—— mill - - - - -	311	Klissa castle - - - - -	199
——, port - - - - -	310	—— mountains - - - - -	197
—— village - - - - -	311	Kluda islets - - - - -	194
Katakolo bay - - - - -	360	Kneza bay - - - - -	225
——, communication - - - - -	360	—— Grande islet - - - - -	226
——, light - - - - -	360	——, light - - - - -	226
——, telegraph - - - - -	360	—— point - - - - -	227
——, cape - - - - -	360	Knezak islet - - - - -	173
——, light - - - - -	360	——, rook northward of 172, 173	
——, telegraph cable - - - - -	360	——, beacon 172, 173	
—— peninsula - - - - -	360	——, mount - - - - -	157
—— village - - - - -	360	Knin - - - - -	189
Kataphorno, lake - - - - -	300	—— town - - - - -	198
Katastari point - - - - -	334	Kobila point - - - - -	252, 258
Katena island - - - - -	169	—— rocks, beacon - - - - -	188
Katic rocks - - - - -	260	Kobravac islet - - - - -	237
Katito river - - - - -	274	Kocensko shoal, beacon - - - - -	179
Katzurbo-nisi islet - - - - -	332	Kocista point - - - - -	258
Kaufkalida islet - - - - -	338, 359	Kok point - - - - -	157
——, light - - - - -	359	—— shoal - - - - -	157, 160
Kavadoni point - - - - -	272	Kokkinos Vrachos - - - - -	328
Kavaja river - - - - -	266	Koliviri islet - - - - -	286
Kavrulia, mount - - - - -	309	Kolivri point - - - - -	366
Kefalo-mandukio - - - - -	284	Kolokithia, gulf of - - - - -	7
Keladio, cape - - - - -	278	Kolorat point - - - - -	145
Kenesta rock - - - - -	372	Koludaro islet - - - - -	139
Kenirat point - - - - -	229	——, light - - - - -	139
Kephali cape ; Corfu - - - - -	287	Kom, mount - - - - -	26
—— ; Kalomo - - - - -	310	Komano village - - - - -	300
—— ; Meganisi - - - - -	306	Kommenitza river - - - - -	345
——, mount - - - - -	352	Komorica islet - - - - -	184
—— point - - - - -	308	Komornik islet - - - - -	179
Kephallinia - - - - -	319	Konja point - - - - -	191
Kephalo islet - - - - -	297	Konsia point - - - - -	286
Kerka inlet - - - - -	187, 189	Koraka islet - - - - -	360
—— river - - - - -	190		

	Page		Page
Korako islets - - - -	301	Kuljar, light - - - -	181
Koromacna bay - - - -	130	Kuloneski islet - - - -	364
Korombili, mount - - - -	353	Kuluras islet - - - -	365
Koroni bay - - - -	368	Kumatodes reef - - - -	362
— bluff - - - -	323	Kumbor channel - - - -	253
— castle - - - -	368	—, coaling station - - - -	254
— town - - - -	368	—, light - - - -	254
—, light - - - -	369	—, prohibited anch. - - - -	252
Korotan islet - - - -	169	Kunelli islet - - - -	319
Korphi, mount - - - -	309	Kunello, cape - - - -	361
Kosa, mount - - - -	260	Kunevima range - - - -	316
Kosara island - - - -	175	Kunupelli point - - - -	358
—, light - - - -	175	Kupari village - - - -	247
Kosiak point - - - -	164	Kurbavala islet - - - -	171
Kosik, mount - - - -	203	Kuriak islet - - - -	160
Kosirina cove - - - -	181	Kurila point - - - -	138
Kosjak isle - - - -	143	Kurtissa, cape - - - -	371
Kosmec islet - - - -	239	Kuruklata village - - - -	325
Kosmerka islet - - - -	182	Kutavos, lake - - - -	328
Kosor islet - - - -	231	Kutsaros, mount - - - -	349
Kotarto rock - - - -	274	Kutzulari, mount - - - -	340
Kotiki, lake - - - -	358	Kuveli islet - - - -	352
Kotola islet - - - -	175, 180	Kyllini - - - -	358
—, shoals near - - - -	175	Kyparissia town - - - -	361
Kotroni, mount - - - -	324		
Kovacine point, light - - - -	137	La Certosa - - - -	92
Kozina islet - - - -	180	— Colonne - - - -	106
Koziraca bay - - - -	157	— Guardia, semaphore - - - -	37
Kraljetto rock - - - -	145	—, wireless telegraph - - - -	37
Kraljevac islet - - - -	195	— Scala shoal - - - -	40
Krapano island - - - -	187	— Vecchia rock - - - -	58
— mole, light - - - -	187	Lacroma island - - - -	247
Krastovica reef - - - -	227	Ladestum - - - -	232
Krathis river - - - -	357	Ladro, port - - - -	239
Kravia islet - - - -	287	Laganj islet - - - -	155
Kremasti, mount - - - -	360	Laghi, cape - - - -	25, 265
Kremik point - - - -	190	Lago Grande, port; Lagosta - - - -	232
Kreul, port - - - -	156	—, directions - - - -	233
Kricin point - - - -	150	—; Meleda - - - -	238
Krionero point - - - -	335	— Piccolo, port - - - -	233
—, light - - - -	335	Lagosta channel - - - -	26, 235
Kripa islet - - - -	156	— island - - - -	232
Krissa, gulf of - - - -	349	—, currents off - - - -	19, 235
Kriz shoal - - - -	227	—, light - - - -	234
Krizice rocks - - - -	160	—, telegraph cable - - - -	226, 233
Krizine point - - - -	236	— village - - - -	233
Krtole bay - - - -	254	Lagostini islets - - - -	234
—, prohibited anchorage - - - -	252	Lagudia rocks - - - -	286
Kruci bay - - - -	261	Laka point - - - -	892
Kruppa river - - - -	167	—, light - - - -	289
Krusevica, port - - - -	175	—, port - - - -	289
Krusica islet - - - -	234	Lakosase rock - - - -	129
Kruzica cove - - - -	166	Lales bay - - - -	25, 265
—, light - - - -	166	Lambiri, cape - - - -	358
Kse point - - - -	326	Lambrino island - - - -	313
Kubenova, mount - - - -	368	Lamiah, mount - - - -	302
Kuciste chapel - - - -	224	Lamjane bay - - - -	174
— road - - - -	224	Lamone river - - - -	78
—, telegraph cable - - - -	225	Lapad bay - - - -	246
Kudromurto, cape - - - -	276	— peninsula, bank, beacon - - - -	245
Kukuljar islets, light - - - -	181	— point - - - -	246
Kukuljina bay, anchorage - - - -	254	Lardigo point - - - -	326
—, prohibited anchorage - - - -	252	Lastua castle - - - -	260
Kula, mount - - - -	230	—, telegraph - - - -	260
— rock - - - -	237	Latisana - - - -	95
Kulina point - - - -	189	Laudara island - - - -	170
Kuljar islets - - - -	181		

	Page		Page
Laudara island, light	170	Lights, Barbaran islet	113
Lazaretto island	284	—, Barcola	100
— islet	174	—, Bari, port	50
Le Catene channel	255	—, Barletta	53
— Secche	39	—, Bergudi harbour	133
Leandra point	244	—, Berguglie bay	158
Lecce cathedral	39, 45	—, Bescanuova	150
Lefkimo bay	285	—, Betina	181
—, anchorage	285	—, Biaka point	205
—, lights	285	—, Bianche point	168
— point	285	—, Bice island	184
—, clearing mark	285	—, Blaca point	208
Lekhena village	358	—, Bol	206
Leme shoal	115	—, Brazza island	205
Lemene river	94	—, Brieste bay	208
Lenard cove	232	—, Brindisi	43, 44
Leone, port	310	—, Brioni islands	118
Lepanto	346	—, Broce	242
Lepetane	252	—, Bua island	196
—, telegraph cable	255	—, Buccari bay	135
—, village	255	—, Budua, port	259, 280
Lesina island	212-215	—, Buso, port	97
—, telegraph cables	212	—, Cabula shoal	118
—, lake	61	—, Canale di Riccioni	74
—, railway	61	—, Cantafico point	245
—, mount	61	—, Caorle	94
—, port	215	—, Capo d' Istria	106
—, directions	217	—, Capodesto, port	190
—, lights	215	—, Cappuccini, mount	70
—, supplies	216	—, Caprara island	59
Lete river	66	—, Carlopago	166
Leucas	303	—, Cassano, port	178
Levant	103	—, Cassion bay	147
Levante bank	144, 145	—, Cassone, port	246
—, port	82	—, Castel di Mezzo	74
—, village	82	—, Castelnouva; Castel Vecchia	197
Levkimni	285	—, ; Topla bay	253
Levrera island	137	—, Catene channel	255
Lewis point	354	—, Cattaro gulf	251, 253-256
Lia, port	333	—, town	257
Liakas, cape	323	—, Cattolica	74
Liapades bay	286	—, Cavala islet	179
Lido channel, pilots	87, 89	—, Cazza islet	231
—, tides	86	—, Central mole; Zengg	151
—, The	82	—, Cervia, port	76
Lievela grands	127	—, Cesenatico	76
— piccolo	127	—, Cherso, port	137
Light-buoy, cape Compare	121	—, Chioggia	84
Lights, general	35	—, Cigale, port	140
—, unwatched	35	—, Citadel; Corfu	284
—, Abbazia	131	—, Citta Vecchia	213
—, Adamich mole	134	—, Cittanuova	110
—, Almissa	203	—, Comisa bay	220
—, Ancona	70	—, Compare, cape	121
—, Andrea point	332	—, Corfu	284, 285, 289
—, Annunziata point	140	—, Corinth canal	355
—, Anti Paxos	290	—, town	354
—, Rhion point	342	—, Corsini, port	77
—, Antivari	261	—, Cossion, port	163
—, Apsiphia islet	350	—, Craul point	39
—, Araklo point	301	—, Crkvenica	149
—, Arbe, port	153	—, Crussia point	147
—, Argostoli, port	327	—, Curzola	226
—, Arta point	174	—, Daksa islet	243
—, river	301	—, Del Gallo point	107
—, Babac island	179		

	Page		Page
Lights, Della Madonna point	191	Lights, Kardamilli, port	371
—, Dente point	111	—, Karober cove	201
—, Diavolo point	59	—, Kastri point	289
—, Dobrigno bay	149	—, Katakolo, cape	360
—, Dolfin islet	155	—, — mole	360
—, Dolnja point	242	—, Kaufkalida islet	359
—, D'Ostro point	251	—, Kervasara bay	300
—, Drace	208	—, Kitries, cape	371
—, Drepano point	347	—, Klek bay	211
—, Dubno point	149	—, Kneza Grande islet	226
—, Duga point	166	—, Koludarc islet	139
—, Duinka islet	187	—, Koroni	369
—, Duino, port	99	—, Kosara island	175
—, Dukato, cape	305	—, Kovacine point	137
—, Durazzo town	266	—, Krapano mole	187
—, Ertac point	149	—, Kremic point	190
—, Eso Grande	174	—, Krionero point	335
—, Eustachio	257	—, Kruzica cove	166
—, Explanation of	35	—, Kukuljar islet	181
—, Fano island	289	—, Kuljar islet	181
—, — port	73	—, Lagosta island	234
—, Fasana	118, 119	—, Laka point	289
—, Ferkanjo point	153	—, Laudara island	170
—, Fiume, port	133	—, Lefkimo point	285
—, Fort Franz	121	—, Lesina port	215
—, — Mare	44	—, Lignano	95
—, St. Felice	84	—, Limeni, port	371
—, Fortino point	213	—, Little Molonta bay	249
—, Fronte, cape	155	—, Lixuri	327
—, Gabriel Baross	134	—, Ljubaz strait (intended)	167
—, Galaxidi, port	350	—, Lucietta islet	171
—, Galera	195	—, Lucina port	158
—, Galere mole	106	—, Luka cove	240
—, Galiola isle	141	—, Lussin Grande	145
—, Galisnik islet	215	—, — Piccolo	139
—, Gallo, cape	44	—, Madonna islet	290
—, Garbe, mount	142	—, — point; Cigale	140
—, Gelsa, port	214	—, —; Pirano	107
—, Gerolimena	372	—, Maestra point	81
—, Gheroghambo, cape	329	—, Magnavacca	79
—, Girolamo	118	—, Maistro point	150
—, Giuliana bay	225	—, Makarska, port	204
—, Gjenovic point	254	—, Malamocco	87
—, Glarenza	359	—, Malinska	148
—, Glavat islet	235	—, Maltempo channel	149
—, Glavica point	201	—, Mamula, fort	251
—, Gomena, cape	208	—, Manfredonia	55
—, Goro point	81	—, Mare, fort	44
—, Gradac village	209	—, Maria Teresa	133
—, Gradisca point	231	—, — Valerie mole	134
—, Grado, port	98	—, Marie Art mole	151
—, Gravosa, port	245	—, Marmi shoal	114
—, Grossa island	168	—, Matapan, cape	373
—, Gruica islet	144	—, Mattinata	56
—, Guiscardo point	321	—, Melangavi cape	354
—, Hoste island	219	—, Meljine bay	253
—, Hramina	181	—, Menders point	262
—, Hrbosnjak	183	—, Merlera point	127
—, Ika, port	131	—, Methoni	365
—, Isola	107	—, Metkovic	210
—, Isthmia	355	—, Mezzo channel	172
—, Itea	351		
—, Jablanaz bay	166		
—, Jadria point	188		
—, Kalamata	370		
—, Kalavrita mole	343		
—, Karantunic	174		

	Page		Page
Lights, Mezzo Meleda -	237	Lights, Phano point -	300
—, Mika point -	177	—, Piave Vecchia -	93
—, Milna, port -	205	—, Pigonati mole and quay -	44
—, Missolonghi -	340	—, Pilaros cove -	321
—, Mola -	49	—, Planchetta islet -	224
—, Molfetta, port -	51	—, Plaunick island -	147
—, Molino point -	137	—, Podvara point -	178
—, Monopoli -	48	—, Point del Gallo -	107
—, Montecuccoli rock -	211	—, Poklib islet -	161
—, Morganillo point -	147	—, Pokonjidol islet -	217
—, Morno point -	346	—, Pola -	121, 122
—, Mortar islet -	139	—, Poljana point -	139
—, Moter island -	181, 182	—, Porer rock -	125
—, Muggia -	105	—, Porto Grande -	215
—, Mula di Muggia -	98	—, Re -	135
—, Mulo islet -	191	—, Posejdonia -	255
—, Murvica islet -	194	—, Postire, port -	205
—, Narenta river -	210	—, Povie cove -	206
—, Navarin bay -	363	—, Poveljana channel, new -	164
—, town -	365	—, Prestenizze point -	136
—, Negritto point -	146	—, Prigradica cove -	229
—, Neo Kastro mole -	365	—, Prinsjak islet -	181
—, Nera point -	130	—, Pristane -	261
—, Neresine -	144	—, Promontore, cape -	125
—, Netak point -	140	—, Psaromyta, cape -	348
—, Neum port -	211	—, Pucisce, port -	205
—, New Poveljana channel -	164	—, Punta Agnuli -	56
—, North quay ; Brindisi -	44	—, Puntadura -	164
—, Novaglia -	162	—, Pusta point -	237
—, Novara point -	290	—, Pylos islet -	363
—, Novi, port -	150	—, Quietto, port -	111
—, Olipa island -	239	—, Rabaz, port -	130
—, Oliveto, port -	200	—, Racisce, port -	225
—, Oltre -	174	—, Radman point -	176
—, Opatovo point -	255	—, Ragusa -	246
—, Opus, fort -	210	—, Vecchia -	248
—, Orebic mole -	224	—, Rimini -	75
—, Orsera -	114	—, Risano -	256
—, Ortona -	63	—, Riso point -	44
—, Oszero -	138	—, Rocchetta -	87
—, Ostro point -	135	—, Rodoni, cape -	265
—, Otranto, cape -	39	—, Rogoznica, port -	191
—, port -	39	—, Rondoni islet -	251
—, Oxia, cape -	319	—, Rose, port -	108
—, Pago, port -	162	—, Rosega, port -	99
—, Papas, cape -	342	—, Rovigno -	116
—, Parenzo -	113	—, Rozenik -	185
—, Pasman strait -	179	—, Rudolf mole -	134
—, Patras -	343	—, Rumelia castle -	342
—, Paxo island -	289	—, Sabba -	105
—, Paxos, Anti -	290	—, Sabbioncello channel -	226, 227, 231
—, Pedagne rocks -	43	—, St. Andrea islet -	121
—, Pedaso -	66	—, point ; Rabaz -	130
—, Pedena point -	118	—, breakwater ;	
—, Pegolotta point -	109	—, Trieste -	102
—, Pelagosa isles -	60	—, rock -	241
—, Pelasgia point -	269	—, Antonio point -	206
—, Penna point -	44	—, Bernardino point -	108
—, Perasto -	256	—, Christoforo -	shoal
—, Pervicchio island -	150	—, (building) -	162
—, Perzagno -	257	—, Euphemia cove -	321
—, Pesaro -	74	—, Felice fort -	84
—, Pescaria mole -	246	—, Giorgio cove -	152
—, Petalidi -	369	—, point -	214
—, Petrcani village -	176	—, port ;	
—, Petroleum port ; Fiume -	133	—, Hoste	
—, Pettini island or rock -	241	—, island -	219
		—, ; Lesina -	214

	Page		Page
Lights, St. Giovanni	205	Lights, Spalato, port	199
——— point	264	——— Speo point	201
——— Marco islet	148	——— Spignon	87
——— Martino point	206	——— Stagno	242
——— port ; Brazza	206	——— Stamphani islet	339
——— ; Cherso	137	——— Sto'cnica point	218
——— Nicolo church ; Gravosa	245	——— Stretto bridge	182
——— islet	259	——— Suca Prutina	164
——— point ; Oliveto	200	——— Tajer, port	170
——— ; Pucisce	205	——— Teodo bay	255
——— ; Sebenico	188	——— Terstenik island	145
——— Pietro islet	122	——— port	225
——— , port	205	——— Tiascica point	184
——— rock	107	——— Tignoso islet	282
——— di Nembo	143	——— Tonera islet	153
——— Rocco point	248	——— Torcola island	215
——— , Sale cove	170	——— Trani, port	52
——— , Salvore point	108	——— Trappano	208
——— , Samana point	267	——— Tre Sorelle island	173
——— , Samos bay	322	——— Tremiti islands	59
——— , San Ambrose mole	151	——— Trieste	102, 103
——— Antonio channel	188	——— Tun Veliki island	158
——— point	159	——— Turka point	255
——— Cataldo	41	——— Turlide	340
——— point ; Bari	50	——— Ubas point	130
——— Domenico canal	84	——— Uglian island	174
——— Domino island	59	——— Ulbo, port	160
——— Euphemia, port	174	——— Umago, port	109
——— Girolamo pier	219	——— Unie island	140
——— Nicola isle	59	——— Valdibora bay	116
——— Nicolas mole	343	——— Valle Grande bay	229
——— Pietro point	174	——— Valona bay	269
——— Theodoro point	327	——— Vardiani island	325
——— , Sansego	142	——— Vasilico bay	305
——— , Santa Caterina islet	179	——— Vathi, port	332
——— Croce	188	——— Veglia, port	146
——— islet	57	——— Venier castle	167
——— point	139	——— Verbenico	150
——— Domenica point	255	——— Veruda, port	124
——— Maria di Leuca	37	——— Verudella point	124
——— Maura	303, 305	——— Vodice	186
——— Teresa mole	102	——— Volosca, port	131
——— , Sapienza island	366	——— Volovica point	261
——— , Saseno island	268	——— Voschizza point	149
——— , Schiavina, port	176	——— Vostitza	357
——— , Sebenico channel	187	——— Vrana point	157
——— , port	188	——— Vranac point	229
——— , Secca del Fico	44	——— Zacca point	137
——— , Segna, port	151	——— Zaglava rock	136
——— , Selce	149	——— Zalic, port	159
——— , Selve island	159	——— Zante bay	335
——— , Senigallia	72	——— Zapuntello, port	157
——— , Sepurine village	186	——— , Zara	177
——— , Sestrice islet ; Sabbioncello	227	——— Vecchia	179
——— ; Tajer	170	——— , Zelenica	253
——— , Shutegea point	257	——— , Zengg, port	151
——— , Sibuljina point (intended)	166	——— , Zichy mole	134
——— , Sistiana	100	——— , Zirona channel	194, 195
——— , Sivota island	277	——— , Zlarin, port	185
——— , Skardamula	371	——— , Zlosela	181
——— , Skerda island	163	——— , Zubrian point	196
——— , Skinari, cape	334	——— , Zuri channel	183
——— , Skrigeva point	234	Light-vessels	35
——— , Slano, port	242	——— , Fiume	133
——— , Sosti island	340	——— , Trieste	102, 103
——— , Sottile point	106		
——— , Spalato passage	201		

	Page		Page
Lignano, port	95	Lucina, port	158
—, buoys	95	—, light	158
—, directions	96	Lucizza, port	148
—, light	95	Lucnjak islet	227
Limeni, port	371	Luka cove; Brazza	206
—, light	371	—; Giuppana	239
Limnea	299	—, light	240
Lingua	212	—, telegraph	240
Linguetta, cape	269	— island	171
Lipso point	305	—, port	224
Liquentio harbour	2	— village	240
Lissa channel	218	Lukavei islets	215
— island	218	—, current near	215
—, currents	19	Lukovac islet	230
—, light	218	Lukovaz islet	154
—, population	218	Lukovic house	255
—, telegraph cable	218	Lukovo	152, 165
— town	220	Lunga island	114
—, supplies	220	— point; Almissa	202
—, telegraph	220	—, beacon	202
Lissin, mount	260	—; Brazza	206
Lissus	264	Lungo, port; Bacili islets	169
Little Canidole island	141	—; Nera point	130
— Molonto bay	249	—; Unie	141
—, directions	249	Lupac island	185
—, light	249	Luro hills	185
— Oriole islet	144	— river	301
— Palermo	212	Lusa, port	353
— Vodnjak islet, shoal	216	Luski island	171
— Zirona island	194	Lussin channel	144
Livadi bay	327	—, light	144
Livadia point	368	— Grande village	144
— town	352	—, light	145
Livadostro bay	353	— island	138
—, port	353	—, aspect	138
Livathi bay	326	—, telegraph cable	136
Livenza river	94	— Piccolo, port	138
Liverpool	46	—, communication	139
Livitazza peninsula	275	—, directions	139
— port	275	—, lights	139
Lixuri	327	—, storm signals	139
—, light	327	—, supplies	139
—, telegraph cable	327	—, telegraph cables	139
Lizanj island	175	—, tides	139
Ljubaz bay	165	—, time signals	139
— strait	166	— town	139
—, light (intended)	167	Lustica point, telegraph cable	251
Lloyd's arsenal; Trieste	103	Lutostrak islet	144, 155
Logaru, lake	301	Lutraki, anchorage	354
Logorun island, anchorage	186	— bay	299
Lokovac islet	232	Lykademoss, mount	364, 368
Lombardy	5, 79	Lykursi village	273
London	46		
Longo, port	366		
Loni point	162		
—, telegraph tower	161		
Look-out hillock	339	Macaknar islet	201
Loortha bay	323	Maccarone point	38
Loparo bay	154	Macedonia	25
Loretto tower	67	Macerata	67
Lovcen, mount	251	Macina shoal	196, 202
Lovrana	131	—, beacon	202
—, light	131	Macria point	307
Low rocks	310	Maddalena bay	189
Lubista, mount	358	— cove, church	168
Lucice anchorage	206	Madonna bay	117
Lucietta islet, light	171	— degli Angeli	94
		— del Scalpello islet	256

	Page		Page
Madonna di Marina	82	Malta island, telegraph cable	336
— islet	290	— islet	194
—, light	290	Maltempo channel	148
— point; Cattaro	252	Mamotika, mount	368
—; Cigale	140	Mamula, fort	251
—, light	140	—, light	251
—; Pirano	107	Mandoler, port	193
—, light	107	— rock	194
— shoal	291	Mandracchio dock	101
—, clearing marks	291	Mandrie cove	163
Maestra point	81	Mandukio	283
—, current	22	Manego, port	221
—, fog signal	82	Manera bay	193
—, light	81	Manfredonia, gulf of	6, 33, 55
Maestro bay	242	—, hospital	55
—, anchorage	242	—, lights	55
—, water	242	— road	55
— point	176	—, directions	55
— shoal, beacon	176	—, supplies	55
—, The	15	—, town	54
Maga Khoros point	286	—, trade	55
Maggiore, monte	29, 128	Mani peninsula	368
Maglia	46	— village	372
Magnaremi point	220	Manzi rock	59
Magnavacca, port	78	Manzo, port	159
—, lights	79	Maon channel	163
Magresina islet	160	— island	163
— pice	160	Mara point	308
Maharci point	238	Marafi channel	91
Maina peninsula	368	Marano channel	95
Maistro point	150	— lagoons	94
—, light	150	— point	364
Maizan islet	227	— steeple	95
Majella, mount	3, 63	— town	95
Makarska, port	204	— village	66
—, lights	204	Maratheas point	347
Makri island	319	Marathia bay	311
Makriamiti point	299	—, cape	338
Makrinoro ridge	294, 300	— point	351
Makro island	353	Marathon point	362
Makryno, mount	272, 368	Marathonisi islet; Navarin	364
Malaluka bay	260	—; Zante	338
— cove	202	Marathopolis	362
Malamocco channel, depths	90	Mare di Karin	167
— island	85	— Novegrad	167
—, wireless telegraph	86	—, fort, light	44
—, port	85	Marecchia river	74
—, beacons	86	Maresca Santa Agata, wood	61
—, buoys	86, 87	Margarina point	142
—, coal	86	Maria point	185
—, depths	85, 89	— Teresa mole	133
—, directions	90	—, lights	133
—, fog signal	87	Marian, mount	198
—, lights	87	Marie Art mole, light	151
—, pilots	87	— Valerie mole	133
—, quarantine station	86	—, light	134
—, semaphore	86	Marina di Trani	52
—, spoil buoy off	85	Marine hospital; Pola	124
—, tides	86, 92	Marinkovae island	217
— steeple	85	Markiara islet	232
— to Venice	89	Markianda Biela rock	234
Malfi, port	243	— reef	234
Mali Goli islet	152	— rock	234
Malinska, light	148	Marmaka point	331
— road	148	Marmari, port	372
— village, water	148	Marmi shoal	114
Mali-Zaton bay	243	—, light	114

	Page		Page
Marmi de Mezzo shoal -	114	Messiniakos -	367
— Grande shoal -	114	Mestre -	88
—, buoy -	114	Metauro river -	72
Marmorì reef -	289	Metaxoto point -	311
Marnic rock -	240	Meteorological tables -	374-379
Marseilles -	46, 295	Methone -	365
Martignano bank -	96	Methoni -	365
Martincica anchorage -	144	—, anchorage -	366
Martinisko, port -	214	— channel -	365
Martinscica, port -	134	—, directions -	366
Masirina islet -	183	— town -	365
Maslenjac islet -	233	—, light -	365
Maslinovac islet -	190	Metkovic village -	209
Massarine islet -	156	—, coal -	210
Mata shoal, beacon -	162	—, light -	210
Matapan, cape -	373	Mezapo, port -	372
—, aspect -	373	Mezza Meleda, anchorage -	27
—, light -	373	Mezzaluna point -	67
—, soundings south and		Mezzo channel -	172
— west of -	5	—, approaches from -	
— peak -	373	— westward -	172
Matja river -	262	—, directions -	173
Mattinata, anchorage -	56	—, lights -	172
—, light -	56	— island -	240
Maturaga point -	112	— road -	240
Mavro, mount -	368	— strait -	240
— Vuni; Kervasara -	299	—, anchorage -	240
—; Papas -	358	— Meleda, port -	237
Mavronoros, mount -	275, 291	—, directions -	238
Mazar cove -	136	—, lights -	237
—, telegraph cable -	136	—, telegraph cable -	236, 238
Mazoma lagoon -	301	—, mount -	73
Mazzocco woods -	61	—, port -	141
Measured mile; Trieste -	106	— village -	240
Medolino, anchorage -	126	Miaulis rock -	309
—, gulf of -	126	Miggiano, port -	28
—, beacons -	126	Mignies monastery -	325
—, directions -	126	—, village -	325
— village -	125	Mika point, fog signal -	177
Medvjak point -	156	—, light -	177
Meganisi channel -	306	Mikalitza, mount -	280
— island -	306	Mikavica rock -	183
Melada island -	157	Mileto point -	60
—, telegraph cable -	159	—, telegraph cable -	58, 60
— village -	158	Milna, port -	205
Melangavi, cape -	353	—, lights -	205
—, light -	354	Miniatika, mount -	368, 373
— peak -	353	Mirabella castle -	203
— promontory -	353	Miramar castle -	100
Meleda channel -	235	—, telegraph cable -	100
—, anchorage -	25, 27	Mirangi village -	285
—, current -	19, 235	Mirlia point -	357
— island -	235	Misa river -	71
—, south coast -	236	Misiak island -	185
—, telegraph cable -	236	Misniak islet -	165
Melita island -	236	Misnjak bank -	169
Meljine bay -	253	— islet -	239
—, light -	253	Missipezza shoal, bell-buoy -	40
Menders point -	261	Missolonghi, anchorages -	340
—, light -	262	—, approach -	340
Merkan islet -	247	—, buoys -	340
Merlera island -	289	—, directions -	340
— point -	127	— lake -	341
—, light -	127	—, lights -	340
Mertenjak islet -	179	—, telegraph -	341
Mertovnjak islet -	184	— town -	341
Mesola village -	80		

	Page		Page
Mladine islet - - -	234	Morno point - - -	346
Modon town - - -	365	——, light - - -	346
Mogarone, mount - - -	107	—— river - - -	346
Mola town - - -	48	Morovnik bank - - -	156, 160
——, light - - -	49	—— islet - - -	156, 160
Molfetta, port - - -	51	Mortar islet - - -	139
——, lights - - -	51	——, light - - -	139
Molimeino island - - -	351	Morter bay - - -	181
Molini cove - - -	151	——, anchorage - - -	182
—— point - - -	152	——, directions - - -	182
—— shoal, beacon - - -	152	—— island - - -	181
Molino point - - -	137	——, lights - - -	181, 182
——, light - - -	137	Mossor range - - -	203
Moll rock - - -	180	Mostar - - -	209
Molo, gulf of - - -	332	——, railway to - - -	8
Molonta, anchorage - - -	25	Movar, mount - - -	193
—— islet - - -	249	Mozza tower, anchorage near ;	
—— peninsula - - -	249	Campomarino - - -	61
——, ports - - -	249	; Sta. Maria di Leuca - - -	37
——, directions - - -	249	Mrkenta Biela rock - - -	234
——, Little, light - - -	249	Mucchia tower - - -	63
Monda, cape - - -	323	Mueva shoal - - -	115
——, telegraph cable - - -	320	Muggia bay - - -	105
Monfalcone village - - -	98	——, lights - - -	105
Monopoli port - - -	48	——, port regulations - - -	105
——, coal - - -	48	——, water - - -	105
——, light - - -	48	Mugurone point - - -	38
——, tides - - -	23	Muja islets - - -	193
Montagna channel - - -	166	Mula di Muggia bank - - -	98
Montagnola - - -	71	——, light - - -	98
Montague rocks - - -	338, 359	Mulo islet - - -	191
——, clearing marks - - -	338	——, light - - -	191
Monte Grosso point - - -	202	Munda, cape - - -	352
——, telegraph cable - - -	202	Muria, lake - - -	361
—— Grugno point - - -	56	—— mount - - -	360
—— Maggiore - - -	29	Murvica islet - - -	194
—— Marana, fort - - -	68	——, light - - -	194
—— Promina mines - - -	189	Murzo, port - - -	277
—— Saline - - -	122	——, supplies - - -	277
—— Viso - - -	79	—— village - - -	275, 277
Montebello tower - - -	62	Musil, fort - - -	119, 124
Montecuccoli rock - - -	211	Musone river - - -	67
——, light - - -	211	Mutignano town - - -	64
Montenegrin boundary - - -	257, 261	Muzzana - - -	95
Montenegro mountains - - -	7, 16, 168	Myrtavi point - - -	297, 301
—— range - - -	256	Mytika bluff - - -	280, 296
Montepagano - - -	64	—— point - - -	309
Montesanto, port - - -	67	—— village - - -	309
Monticello tower - - -	57	——, communication - - -	309
Monton island - - -	179	——, telegraph - - -	309
Montona forest - - -	111	——, supplies - - -	310
Montone river - - -	76	Myrto, gulf of - - -	330
Moodra island - - -	307		
Moraca river - - -	263	Naples - - -	46
Moracnik islet - - -	236	Naplovac rocks - - -	228
Morea castle - - -	342	Nard point - - -	140
——, currents off - - -	17, 18	Narenta channel - - -	207
——, soundings off - - -	5	——, current - - -	19
——, western coast of - - -	358	—— river - - -	209
Morena, mount - - -	362	——, beacons - - -	210
Morganillo point - - -	147	——, depths - - -	210
——, light - - -	147	——, directions - - -	210
Morinj river - - -	256	——, lights - - -	210
—— village - - -	256	——, outer anchorage - - -	210
Morinje lake - - -	187	—— town - - -	209
Morkan, mount - - -	230		
Morlaccia channel - - -	148, 151, 165		

	Page		Page
Narrows, The; Corinth, gulf of	342, 346	North America	101
—, current	346	— channel; Corfu	281, 291
—, directions	347	—, directions	291
—, light	342	— Germany	40
Nauplia, railway to	8, 344, 354	— quay, light; Brindisi	44
Naupaktos	346	Nosdre rock	172, 182
—, anchorage	346	Nosize point	238
Naval establishments	35	Notices to Mariners, explanation of	35
Navarin bay	363	Novaglia bay	162
—, anchorage	364	— church	162
—, aspect	364	—, port	162
—, directions	364	— village	162
—, light	363	Novaglie tower	38
—, supplies	365	Novana	67
—, fort	364	Novara point, light	290
—, point	364	Novegrad	151
—, town	364	— town	167
—, light	365	—, telegraph	167
Navigation of the Adriatic	23-34	Novi, port	150
Nedilja point	211	—, lights	150
Nedon river	370	— town	149
Needles, Isle of Wight	71	Novillara, mount	73
Negritto point	146	Nozdre cove	157, 159
—, light	146	Numana village	67
Neios cove	332	Nuovo, fort; Prevesa	295
Nekhori village	301	—, shoals off	295
Neo-Kastro, fort	365	—, port; Ancona	68
—, light	365		
—, supplies	365	Obiak islet	230
— town	364	Obinus point	181
Nera point; Istria	130	Oboj islet	180
—, light	130	Oboti, pilots	263
—; Ithaca	332	Observatori island	308
Neresine, light	144	Onusai	366
Nero, mount	272, 319	Eta mountain	298
Nestor cave	362	Ofanto river	54
Nestus river	203	—, shoal north-west of	54
Netak point	140	Official notices	35
—, light	140	Oklucie point	169
—, signals	141	—, buoy	169
—, telegraph	141	Okrug point	195
Neuf, fort	283	Oleinium	262
Neum, port	211	Old Poveljana bay	165
—, light	211	Olipa island	238
New Corinth	354	—, light	239
— Poveljana channel	164	Olivet, mount	284
—, beacon	164	Oliveto, anchorage	206
—, light	164	— cove	214
— port	163	—, port	200
—, current	164	—, light	200
— village	163	— village	200
— York	132	Olivi islet	120
Nicolo di Mitika, port	286	—, shoal	121
Nicopolis	280, 294	Olmi, fort	106
— bay	301	Olmice, cape	353
Nisakulia islet	365	Olmo grande, port	123
Nisi village	369	— piccolo, port	123
Nisvoro river	268	Oltre, light	174
Niviza rock	150	—, telegraph cable	175
Njioice; Cattaro	252	Olynta, port	200
— village	148	Omago, port	154
Noce bay	261	Ombra inlet	243
—, light (occasional)	262	—, directions	246
Nona bay	165	—, water supply	244
— town	165, 177	—, telegraph cables	244
Norikum point	234		
Norino	209		

	Page		Page
One gun point - - - -	284	Ovrat islet - - - -	236
— tree hill - - - -	307	Ovria pay - - - -	316
Onœum - - - -	203	Oxia bay, anchorage - - - -	318
Opat, mount - - - -	171	—, cape - - - -	319, 339
Opatovo point, light - - - -	255	—, light - - - -	319
Opchina, mount - - - -	100	— island - - - -	319
— village - - - -	99	— peak - - - -	319
Opis Aito bay - - - -	322	Oxoi point - - - -	322
—, telegraph cable - - - -	322	— village - - - -	331
Opus - - - -	209		
—, fort, light - - - -	210	Padrone, mount - - - -	68
Or shoal - - - -	108	Padua - - - -	83, 88
Orahovac - - - -	256	Pagania peninsula - - - -	275
Orebic mole, light - - - -	224	—, port - - - -	275
—, telegraph - - - -	224	Pago bay - - - -	161
— village - - - -	224	—, anchorage - - - -	162
Orfano channel, depths - - - -	90	—, directions - - - -	162
Orias - - - -	372	— channel - - - -	161
Orio bank - - - -	97	— island - - - -	161
Oriole, great - - - -	144	—, eastern shore - - - -	161
—, little - - - -	144	—, south coast - - - -	165
Orliach mountain - - - -	146	—, telegraph cables - - - -	161
Orsera castle - - - -	114	—, west coast - - - -	162, 163
— islet - - - -	117	—, port - - - -	162
— port - - - -	114	—, light - - - -	162
—, approach - - - -	114	— town - - - -	162
—, directions - - - -	114	Palacrum, cape - - - -	287
—, lights - - - -	114	Palaeuvna peak - - - -	352
Orso bay, town - - - -	40	Palascia tower, semaphore - - - -	38
Ortholithia, cape - - - -	330	Palazzo bay - - - -	237
Orto point - - - -	38	—, port - - - -	236
— tower - - - -	48	—, anchorage - - - -	237
Ortona harbour - - - -	63	—, directions - - - -	237
—, lights - - - -	63	Pallazzolo - - - -	95
— town - - - -	63	Palazzuol islet - - - -	145
Oruda island - - - -	145	—, rock eastward of, - - - -	145
Osmine bay - - - -	242	— beacon - - - -	145
Osprey rock - - - -	288	Palazzuoli bank - - - -	145
Ossero channel - - - -	137	—, beacon - - - -	145
—, mount - - - -	138	—, buoy - - - -	145
—, aspect - - - -	128	Paleo Avarino - - - -	362
— point, beacon - - - -	138	— Khalia - - - -	308
—, shoal - - - -	137	— Kastro fortress - - - -	315
— town - - - -	138	— Pyrgo ruins - - - -	300
—, light - - - -	138	Palermo, port - - - -	272
—, telegraph - - - -	138	—, supplies - - - -	273
Ossiak islet - - - -	229	Pali, cape - - - -	265
Ossin islet - - - -	209	— point, foul ground - - - -	24
—, anchorage - - - -	210	— road - - - -	265
Ossit point - - - -	224, 227	Pallotta canal - - - -	78
Ostaria rock - - - -	179	Palma, port - - - -	236
Ostro point - - - -	134	— village - - - -	66
—, light - - - -	135	Palmatero point - - - -	294, 301
Ostuni town - - - -	47	Palo, port - - - -	82
Othoni - - - -	288	Paludi, church - - - -	198
Otok islet - - - -	254	—, port - - - -	197
Otranto, cape - - - -	38	Palughe point - - - -	240
—, current - - - -	22	Paluki point - - - -	360
—, light - - - -	39	Pampano ledge - - - -	60
—, semaphore - - - -	39	— rock - - - -	59
—, port - - - -	39	Panaghia, cape - - - -	297
—, directions - - - -	39	Pandelemona inlet - - - -	315
—, light - - - -	39	Panorma cove - - - -	272
—, railway - - - -	39	Panormus - - - -	272
—, telegraph cables - - - -	39	Pantakratora, fort - - - -	280, 295
—, trade - - - -	39		
Overesse bay - - - -	351		

	Page		Page
Pantera cove - - - -	169	Pegolotta point - - - -	109
Panzano bay - - - -	99	Pelagia, cape - - - -	324
Papas cape - - - -	342	Pelagosa isles - - - -	59
——, anchorage - - - -	342	—— Grande islet - - - -	59
——, current - - - -	343	——, light - - - -	60
——, light - - - -	342	——, wireless tele- graph (pro- posed) - - - -	60
——, shoal off - - - -	342	—— Piccola islet - - - -	60
——, clearing marks - - - -	342	Pelagias point, light - - - -	269
Papozze village - - - -	79	Pelazza bay - - - -	79, 81
Paralba, mount - - - -	93	Peles, port - - - -	191
Paramythia river - - - -	278	Pelestrina church steeple - - - -	84
Paranchi islets - - - -	173	—— island - - - -	84
Parapigadi islet - - - -	333	Pellegrino, cape - - - -	213
Parathera point - - - -	309	——, current - - - -	213
Parenzo, port - - - -	112	—— point - - - -	247
——, coal - - - -	113	Peloroso road - - - -	85
——, directions - - - -	113	Pelosa tower - - - -	49
——, light - - - -	113	Pelova point - - - -	146, 148
——, tides - - - -	113	Peluso islet - - - -	337
Parga - - - -	278	Peneda point - - - -	118
Parnassus, mount - - - -	349, 352	Peneus - - - -	360
Parnissus valley - - - -	368	Penna point; Brindisi - - - -	41
Parathera point - - - -	309	——, light - - - -	44
Parzanj islet - - - -	212	——; Vasto - - - -	62
Paschiliman, lake - - - -	268	—— tower - - - -	45
Pasman island - - - -	175	Perasto, light - - - -	256
——, submarine cable - - - -	175	——, prohibited anchorage - - - -	252
——, telegraph stations - - - -	175	——, telegraph cable - - - -	256
—— strait - - - -	29, 178	—— village - - - -	256
——, anchorage - - - -	180	Percia Glava, mount - - - -	258
——, directions - - - -	179	Pericolosa - - - -	126
——, lights - - - -	179	——, buoys - - - -	126
—— town - - - -	178	Perkovic - - - -	198
Passalos, cape - - - -	351	Pernata point - - - -	136
Patkio point - - - -	249	Perognola channel - - - -	83
Patroe - - - -	344	Perska, mount - - - -	136
Patras - - - -	344	Pervicchio island - - - -	150
——, anchorage - - - -	343	——, light - - - -	150
——, climate - - - -	345	—— shoal - - - -	150
——, communication - - - -	344	Perzagno church - - - -	257
——, current - - - -	343	——, light - - - -	257
——, directions - - - -	344	—— village - - - -	257
——, gulf of - - - -	339	Pesaro, port - - - -	73
——, harbour - - - -	343	——, lights - - - -	74
——, lights - - - -	343	—— town - - - -	73
——, meteorological table - - - -	376	Pescara river - - - -	63
——, pilots - - - -	344	——, anchorage off - - - -	64
——, roads - - - -	343	Pescaria mole, light - - - -	246
——, quarantine - - - -	345	Peschici anchorage - - - -	57
——, supplies - - - -	344	—— village - - - -	57
——, telegraph cables - - - -	344	Petacciata anchorage - - - -	62
——, trade - - - -	345	Petala island - - - -	316
Patriacale - - - -	89	——, port - - - -	317
Paviliana mountain - - - -	286	——, directions - - - -	317
Pavlovici - - - -	259	Petalidi bay - - - -	369
Paxi - - - -	280	——, light - - - -	369
Paxo island - - - -	289	—— village - - - -	369
——, light - - - -	289	Petallis islet - - - -	306
——, telegraph cable - - - -	290	Petalos rock - - - -	350
Paxos reef - - - -	290	Petka, mount - - - -	241
Pedagne rocks - - - -	43	—— point - - - -	241, 246
——, light - - - -	43	Petra Karavos rocks - - - -	367
Pedaso, light - - - -	66	Petrara islet - - - -	226
—— village - - - -	66	Petrčani village - - - -	176
Pedena point, light - - - -	118	——, light - - - -	176
Pedocchio, port - - - -	226		
Pedrera village - - - -	75		

	Page		Page
Petroleum basin ; Fiume	133	Plataria bay	277
— port, light	133	Platea port, northern approach	315
Pettilje, mount	260	—, southern approach	317
Pettini islands or rocks ; Ragusa	241	Plateali, port	315
—, light	241	—, beacons	316
— islets ; Premuda	159	—, calibrating range	316
Phanari port	279	—, directions	316
— village	279	—, climate	316
Phano point, light	300	Platia islet	288
Pharæ	370	Plaunick island	147
Pharos	212	—, light	147
Phidaris river	341	Plika islet	156
Phonia island	353	Plitvine cove	229
Piacenza village	79	Ploc point, buoy	160
Pianosa isle	59	Ploca bank	220
Piatti rock	43	Po del Canerino	79
Piave	87	— della Gnocca	81
—, anchorage	93	— Pila	81
— point	93	— delle Tolle	79
— river	93	— di Goro	80
— Vecchia, light	93	— Levante	82
—, port	93	— Maestra	82
Piavice islet	194	— Primaro	78
Piazza di San Marco	88	— Tolle	65
Piccola Pelagosa isle	60	— Volano	79
Pietre Nere point	61	— Grande	79
— tower	54	— river	79
Piganoti mole and quay	44	—, delta of	79
—, lights	44	—, current off	21
Pilala plain	346	—, soundings off	4
Pilaros cove	321	—, depths	80
—, light	321	—, tides	22
Pilots, steering commands	35	Poatello river	80
Pindo, mount	267	Pod Kopiste islet	232
Pindus mountain	298	— Markiara islet	232
Pineda	95	Podvara point, light	178
Pinoto	2	Pogarila kela cove	214
Pirano bay	107	Poghonja islets	309
—, port	107	Pogogna point	278
—, light	107	Pogonia peninsula	315
—, supplies	107	Point del Gallo, light	107
Pistros island	313	Pojer shoal, beacon	117
Pitic bank	147	Poklib islet	161
Pizzoli groin ; Bari	50	—, light	161
— mole, light	50	— rock	154
Placena shoal	188	Pokonjidol islet	217
—, beacon	188	—, light	217
Plaka spit	302	Pola	120
Plakka islet	288	—, anchorage	121
— point	286	—, coal	123
— rocks	290	—, communication	120
Plana island	190	—, directions	123
Planac islet	179	—, docks	123
Planche, cape	204	—, inner harbour	120
Planchetta islet	223	—, lights	121, 122
—, light	224	—, measured mile	124
— islets	216	—, meteorological table	377
— shoals	218	—, port	120
Planik islet	160	—, railway	120
— islets	210	—, regulations for entry of foreign	
Planjak islet	226	— war-vessels	121
— rock, beacon	227	—, supplies	123
Planka cove	193	—, tides	121
— point	193	—, time signal	121
—, current	20	—, torpedo ground	122
Platamone point	258	—, town	120
		Polignano, port	48

	Page		Page
Polis, port	322	Prasa island	312
Poljana point, light	139	— shoal	312
Pomer anchorage	126	Praso islet	353
Pomestak islet	236	Prasons islets	311
Pomo islet	222	Prasophillo islet	353
— rock	222	Prastici rock, beacon	183
Pompejana strait	239	Prasudi island	276, 292
Pomposa steeple	80	Prasuthi island	348
Pondiko island	313	—, rock west of	348
— Kastro	360	Pregeba bank	154
— shoal	313	Premuda island	156
Ponte-lagoscuro	80	—, anchorage	156
Porer islet	116	—, port	156
— rock	125	Prestenizze point	131, 136
—, fog signal	125	—, light	136
—, lights	125	Prevesa	294
—, semaphore	125	—, anchorage	296
— shoal	117	—, bar	295
Porro, mount	305	—, buoys	296
Portamichi harbour	349	—, communication	295
Port Lago, Grande; Lagosta	232	—, current	296
—; Meleda	238	—, gulf of, north coast	296
—, Piccolo	233	—, southern shore	297
— Manzo	159	—, port	295
— St. Clemente	216	—, soundings westward of	5
— Pietro di Nembo	143	—, strait	295
— Tre Pozzi	230	—, telegraph	295
—, directions	230	—, trade	295
— Porticello tower	57	Prevlaka islet	254
Porto Grande	215, 223	Prezida cove	164
— Parti Acque	82	Priestap coves	233
— Re	134	— island	232
—, lights	135	Prigadica cove	228
—, supplies	135	Prihodisce point	233
—, telegraph	135	Priluka, port	131
— Secco tower	84, 90	Primara	65
Portogruaro	94	Primaro	78
Portonuovo islet	56	Primer, port	98
Portus Classis	2	Prinsjak islet, light	181
Posedaria	167	Prisba point	231
Poseidonia, port	355	Prisna cove	166
—, light	355	— shoal, beacon	166
Posta della Fasci	38	Pristane	261
—, anchorage	39	—, light	261
Postire, port	205	Prohodisce point	228
—, light	205	Proisd island	228
Potami river	285	— point	229
—, light (occasional)	285	Proklian, lake	190
Potenza Picena	67	Promina mines	200
—, river	67	Promontore, cape	29, 125
Pothani point	294	—, fog signals	125
Potplat cove	229	—, light	125
Poveglia island, tides	86, 92	— village	125
— steeple	85, 90	Pronos bay	232
Povie cove	206	Prote	362
—, light	206	Proti channel	362
— village	206	— island	362
Povljana, New, channel	164	Provati island	313
—, beacon	164	— islet	311
—, current	164	Proversa channel, Great	170
—, light	164	— grande, shoal, beacon	170
—, port	163	Provicio island	185
—, village	163	—, anchorage	186
—, Old, bay	165	—, light	186
Pozzelli tower	47	—, telegraph cable	186
Prapatna, port	235	— village	185
—, telegraph cable	236, 238	Provizada point	225

	Page		Page
Prucanik point . . . . .	179	Ragusa, railway . . . . .	246
Prutna point . . . . .	164	— road . . . . .	247
— shoal, buoy . . . . .	164	—, telegraph . . . . .	246
—, telegraph cable . . . . .	161	—, water . . . . .	246
Prznjak islet . . . . .	230	— Vecchia . . . . .	248
Psaromyta, cape . . . . .	348	—, light . . . . .	248
—, light . . . . .	348	Raguseo cove . . . . .	268
Psyko, mount . . . . .	361	Railways . . . . .	7
Pucisce, port . . . . .	205	Rain at Venice . . . . .	11
—, light . . . . .	205	Ramitello wood . . . . .	61
—, telegraph cable . . . . .	204	Rancon point shoal . . . . .	118
Pulej village, pilots . . . . .	263	—, beacon . . . . .	119
—, telegraph . . . . .	263	Rapagnola tower . . . . .	48
Punta Agnuli, light . . . . .	56	Rapanjasnjak islet . . . . .	182
— d'Oro shoal . . . . .	49	Rasip islets . . . . .	171
—, fort . . . . .	295	Rat point ; Briesta bay . . . . .	208
Puntadura island . . . . .	163	—, Morter island . . . . .	182
—, anchorage . . . . .	164	Ratec point . . . . .	260
—, lights . . . . .	164	Rava island . . . . .	171
—, telegraph cables . . . . .	159, 164	Ravenna . . . . .	2, 77
— point . . . . .	164	Ravna islet . . . . .	182
Pusta point . . . . .	237	—, sunken rocks near . . . . .	182
—, light . . . . .	237	Ravnik islet . . . . .	221
Pylos castle . . . . .	362	—, grotto . . . . .	221
— islet . . . . .	363	Razance islets . . . . .	167
—, light . . . . .	363	Razang point . . . . .	216
— shoals . . . . .	363	Rebizza point . . . . .	146
Pyrgos town . . . . .	344, 361	Recanati, port . . . . .	67
Pyrnatza river . . . . .	369	— town . . . . .	67
		Recina river . . . . .	133
Quaranta rock . . . . .	273	Red bluff or cliff . . . . .	346
Quarnero channel . . . . .	30, 142	—, rocky patch southward of . . . . .	346
— gulf . . . . .	7, 30, 128	Reggio . . . . .	46
—, aspect . . . . .	128	Regulations for anchorage, Foreign	
—, Bora . . . . .	12, 16, 128, 142	vessels . . . . .	9
—, currents . . . . .	20, 143	Reka . . . . .	132
Quarnero channel . . . . .	155	— river . . . . .	133
Quieto . . . . .	111	Remo point . . . . .	258
— bank . . . . .	110	Reno river . . . . .	78
—, port . . . . .	111	Reverol shoal . . . . .	114
—, directions . . . . .	111	Rhion point . . . . .	342
—, light . . . . .	111	Rhizenum . . . . .	256
—, supplies . . . . .	111	Rigani, mount . . . . .	346
— river . . . . .	111	Rimini . . . . .	74
Quimilya point . . . . .	328	—, directions . . . . .	75
		—, fog signal . . . . .	75
Rabaz, port . . . . .	130	—, harbour . . . . .	75
—, lifeboat . . . . .	130	—, light . . . . .	75
—, light . . . . .	130	Rina road . . . . .	194
—, telegraph . . . . .	130	Rinaldo tower . . . . .	41
Racisce, port . . . . .	225	Riniassa castle . . . . .	279
—, light . . . . .	225	Risa, lake . . . . .	274
—, telegraph . . . . .	225	Risano bay . . . . .	256
Radman point, light . . . . .	176	—, water . . . . .	256
Radostak, mount . . . . .	251, 258	— rivulet . . . . .	106
Radovan point . . . . .	143	— town . . . . .	256
Ragusa . . . . .	246	—, lights . . . . .	256
—, coal . . . . .	246	Riso point, light . . . . .	44
—, coast of . . . . .	3	Ristola point . . . . .	37
—, directions . . . . .	247	Rivanj island . . . . .	173
—, landmarks . . . . .	247	Rivolo tower . . . . .	54
—, lights . . . . .	246	Robit hill . . . . .	267
—, meteorological table . . . . .	378	Rocca Vecchia tower . . . . .	41
—, mooring buoy . . . . .	247	Rocchetta channel . . . . .	85
—, navigation . . . . .	25	—, depths . . . . .	90
		—, light . . . . .	87
		Rocco islet . . . . .	165

	Page		Page
Rocky point - - -	342	Rumelia castle, light - - -	342
Rodi, anchorage - - -	57	Rumia, mount - - -	260
— town - - -	57	Rupa cove - - -	129
—, supplies - - -	57	Ruphea, lake - - -	361
Rodoni, cape - - -	265	— river - - -	361
—, light - - -	265		
— roads - - -	264	Sabba, light - - -	105
Rodovari point - - -	291	Sabbioncello channel - - -	224
Rogac cove - - -	237	—, current 19, 224, 228	
Rogacic islet - - -	227	—, directions - - -	
Rogosnica village - - -	203	—, 27, 227, 228	
Rogoznica islet - - -	191	—, lights 226, 227, 231	
— port - - -	191	— peninsula - - -	223
—, directions - - -	192	—, north coast - - -	207
—, light - - -	192	—, telegraph cable 226	
—, telegraph - - -	191	Sabbioni point - - -	91
Roman baths, spring; Pola - - -	123	Sablonava cove - - -	238
Romana column, light - - -	44	Sacca dell' Abate - - -	80
Romantino harbour - - -	2	— di Panzano - - -	99
Rome - - -	68	Saccione tower - - -	61
Ronc point - - -	102	Saccorgiana bay, buoys - - -	124
Ronco point - - -	107	Saida bay - - -	275
— river - - -	76	— shoal - - -	173
Rondoni islet - - -	251	—, buoy - - -	173
—, light - - -	251	— village - - -	275
Ronze anchorage - - -	126	—, supplies - - -	275
Ronzi bay - - -	120	St. Alberto village - - -	78
Rosario, monastery - - -	224	— Ambrozio Treviso - - -	89
— road - - -	224	— Anastasio point - - -	278
Rose, port; Pirano - - -	107	— Andrea battery - - -	217
—, light - - -	108	— islet; Brindisi - - -	42
—; Topla - - -	253	—, Busi - - -	221
—, telegraph - - -	253	—, current - - -	222
Rosega port - - -	99	—; Pola - - -	120
—, light - - -	99	—; Rovigno - - -	117
Rosenjik rock - - -	185	— point; Ithaca - - -	322
Rossa point - - -	56	—; Lesina - - -	217
—, semaphore - - -	56	—; Muggia - - -	105
Rosso port; Lagosta - - -	233	—; Trieste - - -	102
—, directions - - -	234	—, breakwater, lights - - -	102
—, light - - -	234	—, light-boats - - -	102, 103
—, signal station - - -	234	—, port; Croce point - - -	145
—, telegraph - - -	234	—; Ithaca - - -	322
—, Medolino - - -	126	—; Lignano - - -	96
Rotol islet - - -	200	— rock - - -	241
Routes in the Adriatic - - -	28-33	—, light - - -	241
Rovenska, port - - -	144	— tower - - -	40
Rovera island - - -	113	— Angelo castle - - -	287
Rovigno, port - - -	115	— de' Lombardi - - -	54
—, anchorage off - - -	116	—, mount - - -	54
—, beacon - - -	116	— town - - -	55
—, coal - - -	116	— Antonio canal - - -	54
—, directions - - -	116	— mole; Bari - - -	49
—, lifeboat - - -	116	— point, light - - -	206
—, lights - - -	116	— Arcangelo islet - - -	193
— steeple - - -	100	— Benedetto town - - -	66
— town - - -	115	— Bernardino point, light - - -	108
Royal fort; Ragusa - - -	247	— Biagio point - - -	136
Rozenik rock - - -	185	— Brigida islet - - -	113
—, light - - -	185	— Cassano, port - - -	178
Ruda bay - - -	305	—, light - - -	178
Rudda islet - - -	240	— Christoforo point - - -	162
Rudolf mole - - -	133	—, lighthouse	
—, light - - -	134	(building) - - -	162
Ruga bay - - -	298	— shoal - - -	162
—, lake - - -	298	— Ciraco cathedral - - -	67
Rumelia castle - - -	342	— chapel - - -	156

	Page		Page
St. Clemente port	216	St. Giovanni, port ; Kuladio	278
— rocks	68	— village	205
— Demetrio bay	273	—, light	205
— church	272	— Giuseppe of Brazza	27
— Domenica rock	260	— Ilia chapel	259
— Elia chapel	249	— Katerina, cape	281, 287
— point	257	— Leonardo tower	47
— Elias, cape	332	— Lorenzo, port	165
—, mount	272, 368	— Marco islet	148
— Elina	91	—, anchorage	148
— Emiliano tower	38	—, light	148
— Erasmo island	92	— Martino point	206
—, port	92	—, port ; Brazza	206
— Eufemia, anchorage	195	—, lights	206
— islet	195	—, telegraph	206
— point	115	—, ; Cherso	137
—, light	116	—, light	137
— steeple	116	—, telegraph cable ; Pago	152
— Euphemia, port	321	— Martin's telegraph tower	162
—, light	321	— Mateo church	257
— Felice, port	83	— point	257
— Filippo e Giacomo	180	— Michele, telegraph cable	226, 233
—, telegraph	180	— Michiele castle	174
— Francesco convent	217	— Nicola di Casole	38
— George's bay	287	— mole ; Bari	49
— Giacomo church	165	— point	39
— Giorgio anchorage	151	— Nicola bay ; Saseno	267
—, light	152	— chapel ; Bojana	264
— bay	287	— church ; Bol	206
— chapel	232	—, light ; Gravosa	245
— cove ; Giuppana	240	—, ; Traste	258
—, ; Mola	49	— fort ; Lesina	217
—, ; Prevesa	295	—, ; Palermo	272
— islet	256	—, ; San Antonio	188
— monastery	273, 287	— inlet	181
—, mount ; Corfu	281, 286	— islet ; Budua	259
—, ; Lesina	212	—, light	259
—, ; Veglia	146	—, ; Parenzo	112
— point ; Brazza	204	—, tower	113
—, ; Corfu	286	—, mount	212
—, ; Lesina	214	—, point ; Oliveto	200
—, light	214	—, light	200
—, ; Rabaz	130	—, ; Pucisce	205
—, ; Spalato	198	—, light	205
—, port ; Great Zirona	194	—, telegraph	263
—, ; Lesina	214	— Nikolaos banks	325
—, light	214	—, clearing marks	325
—, ; Lissa	27, 219	— islet	324
—, anchorage	219	—, rock off	324
—, directions	219	—, clearing	
—, lights	219	— mark	325
—, supplies	220	— point	324
—, telegraph	220	— Nikolo, fort	188
—, steeple ; Pirano	107	—, islet ; Parga	278
— village	66	—, ; Vathi Vali	309
— Giorgios castle	329	—, ; Zante	334
— hill, fort	308	—, mount	364
— point	326	— point ; Ithaca	331
— Giovanni di Medua	264	—, ; Sebenico	188
—, anchorage	264	—, light	188
—, light	264	—, port	331
—, telegraph	264	— rocks	363
— islet	229	— Paolo islet ; Polignano	48
— point ; Medua	264	—, ; Zara	177
—, ; Sabbioncello	226	— Peter	105
—, ; Veruda	124	— Pietro bay	233
— Giovanni port ; Curzola	229	— chapel	204

	Page		Page
St. Pietro di Nembo, island -	143	Samos village -	322
———, port -	143	Samothraki island -	288
———, light -	143	San Ambrose mole, light -	151
——— in Volta, steeple -	87	—— Antonio channel -	187
——— islet; Breno -	248	———, directions -	188
———; Pola -	120	———, lights -	188
——— mole, light; Spalato -	199	———, prohibited anchorage -	189
——— peninsula, light -	204	——— point, beacon; Arbe, port -	153
———, port; Arbe -	154	———, light; Selve -	159
———; Brazza -	205	———; Verboska -	213
———, light -	205	—— Bartolomeo bay -	105
——— rock, light -	107	———, mooring buoy -	106
——— village -	143	—— Benedetto convent -	136
—— Raffaele islet -	233	—— Caralambo river -	335
—— Rocco point; Brazza -	206	—— Carlo mole -	101
——; Breno -	247	—— Cataldo anchorage -	41
———, light -	248	———, light; Bari -	50
—— Salvador, mount -	281, 285	———; Lecce -	41
—— Sidaro, mount -	329	——— point, tower -	41
—— Spiridione convent; Parga -	278	—— Cremente, current -	90
———, port; Corfu -	286	—— Croce church -	186
—— Stefano church -	153	—— Dionisio church -	336
——— point -	199	—— Domino island -	58
——— tower; Brindisi -	40	———, light -	59
———; Monopoli -	48	—— Elpidio village -	66
——— village -	260	—— Euphemia port, light -	174
—— Ullia, mount -	239	—— Francesco monastery -	202
—— Veto, mount -	161	—— Gennaro anchorage -	41
—— Vicino, mount -	71	—— Georges islet -	350
—— Vito, mount; Brazza -	204, 206	—— Giacomo village -	169
———; Pago -	161	—— Giorgio island; Osera -	114
——— telegraph -	161	———; Venice -	89, 91
——— tower -	48	———, storm signals -	89
——— village -	62	——— village -	263
Saki point -	288	—— Giovanni church -	242
Salagora, mount -	301	——— point -	122
——— road -	301	——— di Pelago islet -	116
Salapina marsh -	54	———, light -	116
Saldon bay -	195	———, rock near -	117
Sale cove -	170	—— Girolamo pier, light -	219
———, light -	170	—— Gregorio point, light -	174
Salentinum prom. -	37	—— Marco church, Lesina -	217
Saline, monte -	122	———; Trieste -	102
Salinello river -	64	——— cathedral; Venice -	88
Salino river -	64	——— channel -	89, 91
Salmeniko, cape -	358	———, depths -	90
Salona, gulf of -	349	——— square -	91
———, port of -	351	—— Marino, mount -	75
——— river -	197	—— Martino bay, Ragusa -	246
——— village -	197	——— town -	61
Salpi, lake -	54	—— Michele mole; Molfetta -	51
Salso, lake -	54	—— Nicola island -	58
Saltarel point -	112	———, light -	59
Salternes; Lefkimo -	285	———, semaphore -	58
———, light (occasional) -	285	—— Nicolas mole -	343
Salterns; Santa Maura canal -	308	———, light -	343
Salvore point -	108	—— Nicolo chapel -	117
———, dangers -	108	——— church -	316
———, fog signal -	108	——— del Lido, breakwaters -	91
———, light -	108	———, buoys -	92
———, signal station -	108	———, depths -	92
Samana point -	267	———, fort -	91
———, light -	267	———, pilots -	92
Samograd islet -	182	———, port -	91
Samos bay -	322	———, semaphore -	92
———, light -	322		
———, telegraph cable -	322		



	Page		Page
Scipar shoal . . . . .	108	Senigallia . . . . .	71
——, buoy . . . . .	109	——, directions . . . . .	72
Scodra . . . . .	263	——, harbour . . . . .	71
Scoglio Grande . . . . .	117	——, lights . . . . .	72
—— Minor . . . . .	117	Sentry bank . . . . .	313
Scrophia point . . . . .	339	Separine village . . . . .	186
——, anchorage . . . . .	340	——, anchorage . . . . .	186
——, port . . . . .	339	——, lights . . . . .	186
—— shoal . . . . .	339	Seraievo, railway to . . . . .	8
——, clearing mark . . . . .	339	Sercica point . . . . .	135
Scutari, lake . . . . .	263	Serpa rocks . . . . .	282
——, pilots for . . . . .	263	Serravalle village . . . . .	79
——, railway . . . . .	261, 263	Servola, telegraph . . . . .	105
——, telegraph . . . . .	263	—— village . . . . .	105
—— town . . . . .	263	Sesola islet . . . . .	304
Sdobba point . . . . .	98	Sestre bank, buoy . . . . .	185
——, port . . . . .	98	Sestrice island . . . . .	170
Sebenico, approaches . . . . .	184	——, light . . . . .	170
—— channel . . . . .	187	—— islets; Lagostini . . . . .	234
——, directions . . . . .	29, 188	——; port Tajer . . . . .	170
——, lights . . . . .	187, 188	——; Sabbioncello . . . . .	227
——, currents near . . . . .	20	——, light . . . . .	227
——, department of . . . . .	168	——, signal station . . . . .	227
——, district of . . . . .	182	Sestrunj island . . . . .	173
——, port . . . . .	187	Settebocche channel . . . . .	158, 172
——, communication . . . . .	189, 198	Sezza island . . . . .	150
——, directions . . . . .	188	Shag rock . . . . .	313
——, light . . . . .	188	Ship rock . . . . .	288
——, prohibited anchorage . . . . .	189	Shore of Adriatic, eastern . . . . .	3
——, supplies . . . . .	189	——, western . . . . .	2
——, telegraph cable . . . . .	185	Shutega point, light . . . . .	257
——, tides . . . . .	189	Sib point . . . . .	160
—— town . . . . .	189	——, shoal, buoy . . . . .	160
—— Vecchio, port . . . . .	190	Sibilla mountains . . . . .	-64, 66
Secca del Arco . . . . .	43	Sibuljina point, light (intended) . . . . .	166
—— Fico . . . . .	43	Sicily . . . . .	46
——, light . . . . .	44	Sicince bay . . . . .	193
—— Monte shoal . . . . .	49	Sidari bay . . . . .	287
—— di Domenico . . . . .	51	——, telegraph cable . . . . .	281
—— Piatti . . . . .	43	Sidero cape . . . . .	284
—— S. Andrea . . . . .	43	Siffanto wind . . . . .	15
Secche bank . . . . .	39	Sign . . . . .	203
Secco (porto) tower . . . . .	84, 90	Signal stations, general information . . . . .	9
Sedlo islet . . . . .	172, 182	Signals, storm . . . . .	10
Segna, port . . . . .	150	——, time . . . . .	9
——, directions . . . . .	151	Sikia channel . . . . .	362
——, lights . . . . .	151	——, port . . . . .	349
——, supplies . . . . .	151	Sile river . . . . .	89, 93
—— town . . . . .	151	Silj islet . . . . .	236
Seka point . . . . .	239	Sillo point . . . . .	149
Seket bank . . . . .	220	Silo islet . . . . .	141
Selada banks . . . . .	266	Silvi castle . . . . .	64
——, buoy . . . . .	267	Simoni, port . . . . .	162
Selce cove . . . . .	149	Singapore . . . . .	103
——, lights . . . . .	149	Sinikol cove . . . . .	272
Sella, mount . . . . .	251	Sipak rock . . . . .	245
Selve bank . . . . .	144	Sipontum marshes . . . . .	54
——, beacon . . . . .	144	Sirocco wind . . . . .	14, 271
—— channel . . . . .	144	Sirolo village . . . . .	67
—— island . . . . .	159	Sissano village . . . . .	125
——, lights . . . . .	159	Sistiana bay, . . . . .	99
—— road . . . . .	159	——, light . . . . .	100
——, telegraph cable . . . . .	159	Sit island . . . . .	173
Semaphore stations, general informa- tion . . . . .	9	Sivota bay . . . . .	305
Semeni river . . . . .	267	—— island . . . . .	277
Sena Gallica . . . . .	71	——, light . . . . .	277
		Skala point . . . . .	176

	Page		Page
Skaphidia monastery - - -	360	Soros island - - -	314
Skaphio, cape - - -	297	Sosti islet - - -	340
Skar shoal - - -	108	_____, light - - -	340
Skara, cape - - -	297	Sottile point; Istria - - -	105
Skarda, island - - -	156	_____, buoy - - -	106
Skardamula village - - -	371	_____, light - - -	106
_____, light - - -	371	_____, measured mile - - -	106
Skerda island - - -	163	_____; Veglia - - -	148
_____, light - - -	163	Sottomarina battery - - -	82
Skervada islet - - -	183	_____, village - - -	82
Skhiza island - - -	367	Soundings, general - - -	4
_____, port - - -	367	_____, in the Adriatic - - -	4
Skilee point - - -	296, 302	_____, off the Ionian islands - - -	5
Skinari, cape - - -	334	and coast of Greece - - -	5
_____, light - - -	334	South America - - -	101
Skino bay - - -	332	_____, channel, directions; Corfu - - -	292
_____, point - - -	332	Spagenta mole; Bari - - -	49
Skisa point - - -	329	Spagnuolo, fort - - -	253
Skopo, mount - - -	334	Spalato channel - - -	201
Skrigeva point - - -	233	_____, current - - -	19
_____, light - - -	234	_____, department - - -	98
_____, signal station - - -	234	_____, passage - - -	27, 201
Skropidi island - - -	307	_____, light - - -	201
Skropio island - - -	307	_____, port - - -	198
Skuliza point - - -	150	_____, buoys - - -	199
Skulj islet - - -	171	_____, communication - - -	198
Skuluki cove - - -	278	_____, directions - - -	199
Skumbi river - - -	267	_____, lights - - -	199
Skupieli islet - - -	240	_____, supplies - - -	200
Skyro cove - - -	332	_____, telegraph - - -	199
Sladienovic bay - - -	242	_____, promontory - - -	197
Slana bay - - -	162	_____, roadstead - - -	199
Slano, port - - -	242	_____, town - - -	198
_____, anchorage - - -	243	Spalmadori channel - - -	217
_____, buoy - - -	242	_____, anchorage - - -	217
_____, light - - -	242	_____, directions - - -	217
_____, telegraph - - -	243	_____, islands - - -	216
_____, village - - -	243	_____, light - - -	217
Slatina bay - - -	162	_____, islets - - -	212
Smerduglia islet - - -	201, 205	Sparti island - - -	307
Smerska cove, telegraph cable - - -	212	Spartokori village - - -	306
Smetna bay - - -	184	Spas, mount - - -	259
Smokova cove, telegraph cable - - -	218	Spasovac cove - - -	151
Smokvica islets - - -	192	Spaun rock - - -	192
Snjeznica, mount - - -	247	Specchia Grande tower - - -	38
Snipe point - - -	315	_____, Ruggieri tower - - -	41
Socava islet - - -	307	Specchiolla tower - - -	41
Sømmering Alps - - -	101	Speo, cape - - -	231
Sokava islet - - -	307	_____, point, light - - -	201
Soline bay - - -	211	Sphacteria - - -	362
_____, cove; Bascavoda - - -	203	Sphaghia island - - -	362
_____; Malfi, port - - -	243	_____, shoal - - -	364
_____; Pasman island - - -	175	Spiglia, port - - -	306
Solkozatz islet - - -	127	Spignon channel - - -	85
Solta channel - - -	27, 201	_____, light - - -	87
_____, current - - -	19, 201	Spina - - -	2
_____, island - - -	200	Spinale tower - - -	57
_____, northern coast - - -	201	Spiridione ledge - - -	278
_____, telegraph cable - - -	204	_____, point - - -	281
Sonte, port - - -	144	Spizza bay - - -	260
Sophia island - - -	313	_____, village - - -	260
Sopot cascade - - -	256	Squero shoal - - -	115
Sordo, port - - -	201	Sridnjak islet - - -	231
Sorella islet - - -	185	Srima bank - - -	187
Sorico shoal, beacon - - -	126	_____, beacon - - -	187
Sorinja, mount - - -	154	Stabilimento Tecnico - - -	104
_____, point - - -	154	Stafida islet - - -	351

	Page		Page
Stagno channel, Great	241	Superior, mount	200
——, fort	241	Superka rock	248
——, light	242	Susana, fort	260
——, Piccolo	211, 241	Susvid, mount	207
—— channel	211	Sutturina river	252
—— town	211	Sutvara island	227
—— town	241	Svegliegamora point	234
Stagnon bay	106	Sveto-bedo peak	166
Stambedar islet	216	Sweet Waters	278
Stamothi island	314	Swiss Alps	83
Stamphani islet	338	Syria	46
——, light	339	Syss, mount	136
Standard time	9		
Stavrota, mount	303	Tagliamento point	95
Stella river	95	—— river	95
Stenigonia beacon	315	Tainie islet	236
—— peninsula	315	Tajan islet	239
Stephano, mount	331	—— islets	234
Stilo, cape	274	Tajer, port	169
—— islet	274	——, directions	170
Stiniva cove, telegraph cable	226	——, light	170
Stinja cove	212	Talbot bank	265
Stipana bay	149	—— buoy	266
Stipanska islet	200	Tale point	160
——, port	204	Taler islet	169
Stobrez cove	202	Tamburlo, point	352
—— village	202	Tapho point	363
Stoja point	122	Tarantata wind	271
Stojan point	152	Taranto	49
Stolivo village	257	——, gulf of	37
Stončica cove	218	Tarsos, mount	352
—— point	218	Tartaro mountain	189
——, light	218	Tatevisnjak islet	183
——, signal station	218	Taygetas	368
——, weather signals	218	Tegetthof, fort	117
Stopanja point	159	Telegraph communication, general	8
Storm signals	10	—— cables, Arbe	152
Strade Bianche	272	——, Athens	354
Stradioto islet	254	——, Bol	204
Straza mount	200	——, Brazza	204
Strazistje, mount	247	——, Cattaro	251
Stretto bridge, light	182	——, Cephalonia	320
—— town	182	——, Cherso	136, 139
Stromorin islet	234	——, Chiave bay	212
Strophades	338	——, Cittanuova	111
Strovathi islets	338	——, Corfu	39, 281, 285
——, anchorage	339	——, Corinth	354
——, light	339	——, Crete	336
Stupar point	371	——, Curzola	226
Stupe bay	236	——, Eso island	173
—— point	236	——, Farasina	131, 136
Stupica bay	183	——, Giuppana	240
Stupiski point	220	——, Gomena	208
Stupova cove	136	——, Grado	98
Stuppa islet	231	——, Grego Morte cove	136
Submarine cables	9	——, Grossa	168
Suca Prutina, light	164	——, Grosso	202
Suez canal	103	——, Igrane cove	212
Suh point	147	——, Isto	157
Suha point	156	——, Ithaca	331
Sukule islet	365	——, Katakolo	360
—— point	365	——, Kuciste	225
——, ridge	365	——, Lagosta	233
Suli mountain	298	——, Lesina	212
Sunk rock	124	——, Lissa	218
——, buoys	126	——, Lussin	136
Supenak rock	238	——, Piccolo	142

	Page		Page
Telegraph cables, Malta	336	Terstenik, port, light	225
—, Mazar cove	136	— village, telegraph	225
—, Melada island	159	Tersteno bay	259
—, Meleda	238	— point	259
—, Mileto point	58, 60	Tesino river	66
—, Miramar	100	Testa tower	47
—, Ombla	244	Tetranisi islets	273
—, Otranto	39	Theganussa	367
—, Pago	161	Theresien-stadt	101
—, Pasman island	175	Thio Adelphi	366
—, Patras	344	Thio-nisi islet	324
—, Paxo	290	Tholetho islet	286
—, Provicio	186	Tholie island	340
—, Pucisce	204	Three Sisters islets	172
—, Puntadura	159, 164	Thyamias	275
—, Sabbioncello	226	Tlascica point, light	184
—, St. Michele; Lagosta	233	—, port	184
—, St. Vito	161	Tiat island, light	184
—, Sansego	139, 142	Tides, Adriatic, general	22
—, Santa Maura	304, 305	Tigani islet	360
—, Sebenico	185	— point	372
—, Selve	139, 159	Tiglia islet	307
—, Sidari	39	Tignoso islet	282
—, Smerska cove	212	—, light	282
—, Solta	204	Tiha, port; Breno bay	247
—, Spassovac cove	151	—; Lesina	213
—, Stiniva cove	226	Timaro harbour	2
—, Stupova cove	136	Timavo river	99
—, Tremeiti	58, 60	Time signals	9
—, Trepito, cape	359	—; Fiume	134
—, Trieste	100	—; Lussin Piccolo	139
—, Turicina bay	212	—; Pola	121
—, Uglian island	175	—; Trieste	104
—, Ulbo	159	—; Venice	89
—, Valona	39, 268	—, standard	9
—, Vasilico bay	305	Timone, port	287
—, Vela Luka	205	Timor, mount	26, 245
—, Velika Luka	203	Tinjarossa, mount	152
—, Zante	39, 336	Tkon, submarine cable	175
—, Zara	177	Tognola reef, beacon	254
—, Zengg	151	Tolentino	67
—, Zlarin	185	Tolero, port	209
—, wireless, general	36	Tomic village	257
—, Ancona	70	Tormor, mount	267
—, Antivari	261	Tonera islet	152
—, Bari	49	—, light	153
—, Comisa (pro-		Topla bay	252
—, posed)	220	—, current	253
—, Malamocco island	86	Torcola channel	215
—, Pelogosa Grande		— island	214
—, (proposed)	60	—, light	215
—, Santa Maria di		Tordino river	64
—, Leuca, cape	37	Torette	180
—, Venice	91	Tornese castle	359
—, Viesti	57	Torrazza tower	77
Tenaron	373	Tortoreto town	64
Tenna river	66	Torunza point	140
Teodo bay	254	Toryne	278
—, lights	255	Tpsa bay	282
Termoli, mount	61	Trachia islet	288
— town	61	Tragetto	78
—, anchorage	62	Tragurium	196
Terstenik bay	225	Trajan, mount	106
— island	145	Trajan mole; Ancona	69
—, light	145	Trakhela, cape	371
— islet	230	Trakilos, cape	349
—, port	225	— point	351

	Page		Page
Trakilos rock . . . . .	351	Trieste, route to . . . . .	31
Tramerka islet . . . . .	157	——, signal station . . . . .	103
Trani, port . . . . .	52	——, supplies . . . . .	104
——, gunnery practice ground	52	——, tides . . . . .	103
——, light . . . . .	52	——, time signal . . . . .	104
—— town . . . . .	52	——, town . . . . .	100
Trapanelli passage . . . . .	43	——, trade . . . . .	101
Trappano church . . . . .	208	Trigi . . . . .	203
——, port . . . . .	208	Trigno river . . . . .	62
——, light . . . . .	208	Trikorfu, mount . . . . .	347
—— village . . . . .	208	Triluke cove . . . . .	175
Trappeto del Principe bay . . . . .	60	Tripia point . . . . .	351
Traste bay . . . . .	25, 258	Tripuljak bay . . . . .	169
—— point . . . . .	258	Triskovae mountain . . . . .	146
Trata islet . . . . .	158	Trisonia island . . . . .	347
Trau bay . . . . .	194	——, port . . . . .	347
—— channel . . . . .	196	——, directions . . . . .	348
——, directions . . . . .	196	——, quarantine . . . . .	284, 345
—— ruins . . . . .	193	Trombola islet . . . . .	126
—— town . . . . .	196	——, anchorage . . . . .	127
—— Vecchio bay . . . . .	193	——, beacon . . . . .	126
Trave rocks . . . . .	68	Tronto river . . . . .	64
Traversa rock, light . . . . .	43	Tsaruchi island . . . . .	351
Tre Porti, port ; Curzola . . . . .	229	Tsimova town . . . . .	371
—— ; Venice . . . . .	92	Tun Mali . . . . .	158
—— Pozzi port . . . . .	230	—— Veliki island, light . . . . .	158
——, directions . . . . .	230	Tunjara cove . . . . .	180
—— Sorelle islets . . . . .	172	Turchi cove . . . . .	59
——, light . . . . .	173	Turicina bay, telegraph cable . . . . .	212
——, rock near beacon . . . . .	172	Turin . . . . .	79
Trebocconi church . . . . .	181	Turino wood . . . . .	62
—— town . . . . .	186	Turka point, light . . . . .	255
Tremiti islands . . . . .	33, 58	Turkika rocks . . . . .	278
——, anchorages . . . . .	58	Turkish frontier . . . . .	294
——, current . . . . .	22	Turkovekla, cape . . . . .	311
——, directions . . . . .	59	——, aspect . . . . .	311
——, lights . . . . .	59	Turli anchorage . . . . .	340
——, telegraph cable . . . . .	58	——, directions . . . . .	340
Trent . . . . .	83	Turlide anchorage . . . . .	340
Trenta Nove . . . . .	335	——, directions . . . . .	340
Trepito, cape . . . . .	359	—— causeway . . . . .	341
——, soundings off . . . . .	5	—— island . . . . .	340
——, telegraph cable . . . . .	359	——, light . . . . .	340
Treporti, cape . . . . .	267	Tyrol . . . . .	83
Treviso . . . . .	93		
Tricase, port . . . . .	38	Ubas, mount . . . . .	129
Trieste . . . . .	100	—— point . . . . .	130
——, anchorage . . . . .	103	——, light . . . . .	130
——, breakwater . . . . .	102	Udine . . . . .	101
——, coal . . . . .	104	Ugendo shoal . . . . .	37
——, communication . . . . .	8, 101	Uglian island . . . . .	174
——, directions . . . . .	103	——, lights . . . . .	174
——, distress signals . . . . .	103	——, telegraph cables . . . . .	175
——, docks . . . . .	103	Ulbo channel . . . . .	160
——, fog signal . . . . .	102	—— island . . . . .	160
——, gulf of . . . . .	100	——, telegraph cable . . . . .	159
——, current . . . . .	21	——, port . . . . .	160
——, depths . . . . .	100	——, light . . . . .	160
——, general remarks . . . . .	100	Ulysses castle . . . . .	333
——, soundings . . . . .	4	—— islet . . . . .	284
——, winds and weather . . . . .	10	—— isthmus . . . . .	338
——, harbour works in progress . . . . .	102	——, telegraph cable . . . . .	331
——, lights . . . . .	102, 103	Umago, port, . . . . .	109
——, new harbour . . . . .	102	——, beacons . . . . .	109
——, old harbour . . . . .	101	——, directions . . . . .	109
——, prohibited area . . . . .	102	——, lights . . . . .	109
——, route from . . . . .	33		

	Page		Page
Umago village . . . . .	109	Veglia channel . . . . .	145, 147
Unie island . . . . .	140	— island . . . . .	146
—, anchorage . . . . .	141	—, telegraph cable . . . . .	136, 146
—, channel . . . . .	141	—, port . . . . .	146
—, light . . . . .	140	—, lights . . . . .	146
—, telegraph . . . . .	141	—, telegraph . . . . .	146
—, port . . . . .	140	— town . . . . .	146
United Kingdom . . . . .	101	Vela Luka cove . . . . .	205
Uso river . . . . .	75	—, telegraph cable . . . . .	205
		— rock, beacon . . . . .	154
		— Straza, mount . . . . .	168
		Velanidia, cape . . . . .	352
		Velebit Gebirge range . . . . .	12, 165
		Veles cove . . . . .	185
		—, telegraph cable . . . . .	185
		Veli Vreh, mount . . . . .	171
		— Zaglav point . . . . .	231
		Velika Dolina . . . . .	207
		— Luka, telegraph cable . . . . .	203
		— Visocica peak . . . . .	166
		Velike, port . . . . .	278
		Velki Grad, mount . . . . .	236
		— Zaton cove . . . . .	243
		Velo Straza, mount . . . . .	139
		Velutzi, mount . . . . .	313, 314
		Venerable banks . . . . .	312
		—, caution . . . . .	312
		—, clearing marks . . . . .	312
		Veneranda battery . . . . .	217
		Veneri tower . . . . .	41
		Venetian coast, caution . . . . .	32
		Venetico island . . . . .	367
		Venice . . . . .	87
		—, anchorage . . . . .	91
		—, approaches to . . . . .	82, 91
		—, arsenal . . . . .	81
		—, channels or ports . . . . .	83
		—, communication . . . . .	7, 88
		—, current signals . . . . .	89
		—, directions . . . . .	90
		—, docks . . . . .	88
		—, Grand canal . . . . .	87
		—, gulf of . . . . .	1
		—, current . . . . .	21
		—, soundings . . . . .	4
		—, winds and weather . . . . .	10, 11
		—, hospital . . . . .	88
		—, lagoons . . . . .	82
		—, navigation of . . . . .	83
		—, main channel . . . . .	85
		—, meteorological table . . . . .	379
		—, pilots . . . . .	87, 89
		—, storm signals . . . . .	89
		—, tides . . . . .	23, 87
		—, time signal . . . . .	89
		—, water . . . . .	89
		—, wireless telegraph . . . . .	91
		Venier castle . . . . .	167
		—, light . . . . .	167
		Verbenico, port . . . . .	150
		—, light . . . . .	150
		—, telegraph . . . . .	150
		Verboska, port . . . . .	213
		—, telegraph . . . . .	214
		— village . . . . .	213
		Verbovica cove . . . . .	226
		— shoal, beacon . . . . .	226
Vacca rock . . . . .	219		
Vacito tower . . . . .	47		
Vagna bay . . . . .	129		
Val Balun . . . . .	221		
— Saladinac . . . . .	221		
— shoal . . . . .	110		
—, buoy . . . . .	110		
Valdibora bay . . . . .	115		
—, light . . . . .	116		
Valditorre bay . . . . .	111		
Valle Grande bay . . . . .	229		
—, directions . . . . .	229		
—, light . . . . .	229		
— town . . . . .	229		
—, telegraph . . . . .	229		
Valmaggiore bay . . . . .	122		
Valona bay . . . . .	268		
—, anchorage . . . . .	268		
—, directions . . . . .	269		
—, light . . . . .	269		
—, telegraph cable . . . . .	268		
— Skala, buoy . . . . .	269		
— town . . . . .	269		
—, telegraph . . . . .	263		
Vanga islet . . . . .	117		
—, anchorage . . . . .	118		
Varano lake . . . . .	61		
— wood . . . . .	60		
Varasova, mount . . . . .	341		
Varcos bay . . . . .	309		
—, cape . . . . .	309		
Vardiani island . . . . .	325		
—, light . . . . .	325		
— shoal . . . . .	326		
Vardicola point . . . . .	142		
—, rocky patches off . . . . .	142		
Variation of the compass . . . . .	34		
Varlam, cape . . . . .	278		
Vascaglia rocks . . . . .	290		
Vasilico bay . . . . .	305		
—, light . . . . .	305		
—, telegraph cable . . . . .	305		
Vasiliko point . . . . .	337		
Vasto town . . . . .	62		
—, anchorage . . . . .	62		
Vathi, port; Ithaca . . . . .	332		
—, light . . . . .	332		
—; Prevesa . . . . .	296		
— town . . . . .	333		
— Vali bay . . . . .	308		
Vathy, port; Dobrena . . . . .	353		
—; Meganisi . . . . .	306		
— village . . . . .	306		
Vecchia, la, rock . . . . .	58		
Veglia bay . . . . .	146		

	Page		Page
Vergada island - - -	180	Volovica point, wireless telegraph -	261
Verkovnjak islet - - -	230	Volpe rock - - -	68
Vermac, fort - - -	256	Volta, San Pietro in - - -	84
——, mount - - -	254	Vomano river - - -	64
Verona - - -	83	Vonitza bay - - -	297
Verseniko, mount - - -	352	——, water - - -	298
Veruda islet - - -	124	Voos village - - -	148
——, port - - -	124	Voschizza bay - - -	130
——, directions - - -	124	—— point - - -	149
——, light - - -	124	——, light - - -	149
Verudella, fort - - -	122	Vostitza bay - - -	357
—— point, light - - -	124	——, anchorage - - -	358
Vescovo point, beacon - - -	110	——, directions - - -	358
Vessels marking wrecks - - -	34	—— town - - -	357
Vetrinitza village - - -	348	——, communication - - -	357
Vettore, mount - - -	66	——, light - - -	357
Vicenza - - -	83	——, supplies - - -	357
Vido island - - -	284	——, telegraph - - -	357
—— village - - -	209	Votemi, fort - - -	274
Vienna - - -	101	Vrachonis, mount - - -	334
Vier bay - - -	137	Vrana, lake ; Cherso - - -	136
Vieste, port - - -	56	—— ; Tunjara - - -	180
——, light - - -	57	—— point, light - - -	157
——, semaphore - - -	57	Vrapac point, light - - -	229
——, wireless telegraph - - -	57	Vranica point - - -	196
Viganj - - -	224	—— village - - -	197
Vilisan point, buoy - - -	106	Vranjak shoal - - -	212
Villanova tower - - -	47	Vromi, port - - -	338
Vipera, mount - - -	26, 223, 227	Vromo islet - - -	352
Virpazan, railway - - -	261, 263	Vromona island - - -	318
Visnica point - - -	209	Vrtlac island - - -	159
Viso, mount - - -	79	Vrulje bay - - -	141
Visoki islet - - -	137	Vrullja cove - - -	203
Vissech - - -	203	Vucine cove - - -	225
Visujuna peak - - -	166	Vulcan point, beacon - - -	315
Vitelli rocks - - -	219	Vuni, mount - - -	310
Vithavri bay - - -	349	Vurko bay - - -	309
——, cape - - -	348	——, anchorage - - -	310
Vitylo village - - -	371	——, supplies - - -	309
Alaska, port - - -	213	——, telegraph - - -	309
Vlasnik islet - - -	233	Vuvalos islet - - -	301
Vlassenik islet - - -	233	Vuvo river - - -	279
Vlassic cove - - -	165		
Vlika hamlet - - -	300		
Vliko, port - - -	307		
Vlioti, cape - - -	320, 330	Wellington, fort - - -	219
Vodice road - - -	186	West Traversa rock, light - - -	43
—— shoal, beacon - - -	187	White river - - -	318
—— village - - -	186	Windmill point - - -	304
——, lights - - -	186	Winds and weather, general - - -	10
——, supplies - - -	187	——, Adriatic - - -	11
——, telegraph - - -	186	——, eastern shore - - -	16
Vodnjak islet - - -	216	——, entrance - - -	15, 16
——, Little - - -	216	——, western shore - - -	17
——, shoal - - -	216	——, Gulf of Corinth - - -	345
Voidias, mount - - -	345	—— Kalamata - - -	368
Voithio Kilia - - -	362	——, the Bora - - -	11-14
Vojuca point - - -	265	—— Imbatto - - -	270
—— river - - -	267	—— Maestro - - -	15
Volano, port - - -	80	—— Siffanto - - -	15
—— tower - - -	80	—— Sirocco - - -	14, 271
Volimi point - - -	298	—— Tarantata - - -	271
Volosca, port - - -	131	——, local observations on - - -	15-17
——, light - - -	131	Wireless telegraph stations - - -	36
Volovica point - - -	260	——, Ancona - - -	70
——, light - - -	261	——, Antivari - - -	261
——, rock near - - -	261	——, Bari - - -	49

	Page		Page
Wireless telegraph stations, Comisa		Zara, department	168
(proposed) 220		—, harbour regulations	177
—, Palagosa		—, port	176
—, Grande		—, lights	177
(proposed) 60		—, prohibited anchorage	178
—, Malamocco 86		—, supplies	177
—, Sta. Maria		—, telegraph cable	177
di Leuca		— town	177
cape	37	— Vecchia town	176, 179
—, Venice	91	—, anchorage	180
—, Vieste	57	—, light	179
Wreck rock	314	—, telegraph cable	180
Wrecks, vessels marking	34	Zarothea, mount	279
		Zaton creek	190
		— village	176
		Zavala, fort	259
		—, point, anchorage	260
Xeravuni, mount	347	—, church	259
Xerias river	363	Zaverda bay	309
Xernovica river	202	— village	309
Xero Johannes, mount	351	Zavinac islets	180
Xilo Castro, mount	310	Zdrelac, port	175
		—, telegraph	175
		— strait	175
Yero-Tripa, cape	302	Zecevo islet	213
Young wind	10	Zebranjak islet	200
		Zelenica, lights	253
		Zeljano bay	254
		—, lights	255
		—, mooring buoys	255
		—, piers	255
		— point, beacon	255
Zabodacki islet	139	Zengg, port	150
Zacca point, light	137	—, directions	151
Zaglav point	205	—, lights	151
Zaglava point	163	—, supplies	151
— rock	136	—, telegraph	151
—, light	136	—, tides	151
Zaglavak point	225	— town	151
Zakan, port	171	Zermanja river	167
Zakynthos	334	Zichy mole	133
Zalic, port, light	159	—, light	134
Zalitz bay	352	Zikovae islet	165
Zamostje point	225	Zirona channel	27, 194
Zanjca, port	252	—, directions	194
Zante bay	335	—, lights	194, 195
—, anchorage	336	— islands	26, 194
—, coal	337	Zlagavir village	170
—, directions	335	Zlarin channel	185
—, light	335	—, directions	185
—, quarantine	337	— island	184
—, supplies	337	—, telegraph cable	185
—, telegraph cables	336	—, port	185
— buoys	336	—, light	185
— caution	336	Zlosela bay	180
—, trade	337	—, port	181
— island	334	—, light	181
—, east coast	334	—, telegraph	181
—, soundings near	5	Zmajan island	184
—, south coast	337	Zonchi battery	184
—, west coast	338	— bay	122
— town	336	Zuana, cape	304
Zaole bay	105	Zuane rock	290
Zaostrog bay	207	Zubrian point	196
Zaporinovac islet	194	—, light	196
Zapuntello, port	157	Zuffo point	129
—, light	157	Zukalia, lake	301
— village	157		
Zara channel	176		
—, anchorage	176, 178		

	Page		Page
Zukovac, point - - -	258	Zuri village - - -	182
Zuri channel - - -	183	Zut channel - - -	172
——, directions - - -	171	—— island - - -	172, 173
——, light - - -	183	Zverinac island - - -	158
—— island - - -	182	Zvirinovic islet - - -	230
——, port - - -	183	Zyrgos, mount - - -	340
——, telegraph - - -	183	Zyria, mount - - -	357



## ADMIRALTY AGENT FOR THE SALE OF CHARTS.

LONDON - - - J. D. Potter - - - 145, Minories, E.C.

SUB-AGENTS. (*In the United Kingdom.*)

BARRY	-	-	T. L. Ainsley	-	-	1, Tip.
"	-	-	Hayes Bros.	-	-	Station Road.
BELFAST	-	-	S. D. Neill	-	-	22, Donegal Place.
BLYTH	-	-	Alder & Co.	-	-	Ridley Street.
BRISTOL	-	-	W. F. Price	-	-	1 and 2, Broad Quay.
CARDIFF	-	-	T. J. Williams	-	-	63, Bute Street, Docks.
"	-	-	T. L. Ainsley	-	-	Primavesi Chambers, James Street.
"	-	-	Wilson & Gillie, Bruce & Son	-	-	91, Bute Street.
COWES (WEST)	-	-	G. H. May & Co.	-	-	126 & 127, High Street.
"	"	-	Pascall, Atkey & Son	-	-	29, High Street.
DARTMOUTH	-	-	Cranford & Son	-	-	Library, Fairfax Place.
DOVER	-	-	C. Clout	-	-	135, Snargate Street.
DUBLIN	-	-	Hodges, Figgis, & Co., Ltd.	-	-	104, Grafton Street.
FALMOUTH	-	-	Williams & Co.	-	-	The Quay.
GLASGOW	-	-	Whyte, Thomson & Co.	-	-	96, Hope Street.
"	-	-	Dobbie, McInnes, Ltd.	-	-	57, Bothwell Street.
"	-	-	D. McGregor & Co.	-	-	57, Bothwell Street.
"	-	-	Kelvin, Bottomley, & Baird, Ltd.	-	-	16-18, Cambridge Street.
GOSPORT	-	-	Camper & Nicholsons	-	-	Yacht Builders.
GREENOCK	-	-	Glendinning & Co.	-	-	33, Cathcart Street.
GRIMSBY	-	-	H. A. Johannesen	-	-	Fish Dock Road.
"	-	-	O. T. Olsen	-	-	Fish Dock Road.
HARWICH	-	-	John Groom & Son	-	-	Lloyd's Agents.
HULL	-	-	Newton Bros. & Holiday	-	-	Prince's Dock.
"	-	-	W. Hakes	-	-	Commercial Road.
KINGSTOWN (CO. DUBLIN)	-	-	R. Perry & Co., Ltd.	-	-	114, Lower George's Street.
KIRKWALL	-	-	David Spence	-	-	42, Broad Street.
LEITH	-	-	D. Stalker	-	-	6 & 8, Commercial Street.
LIVERPOOL	-	-	Philip, Son & Nephew	-	-	45 to 51, South Castle Street.
"	-	-	John Parkes & Sons	-	-	11, St. George's Crescent.
"	-	-	Frodsham & Keen	-	-	31, South Castle Street.
"	-	-	John Bruce & Sons	-	-	25, South Castle Street.
"	-	-	Dobbie, McInnes, Ltd.	-	-	39, South Castle Street.
LONDON	-	-	E. Stanford	-	-	12-14, Long Acre, W.C.
"	-	-	Imray, Laurie, Norie, & Wilson	-	-	156, Minories, E.C.
"	-	-	H. Hughes & Son	-	-	59, Fenchurch Street, E.C.
"	-	-	Sifton, Praed & Co., Ltd.	-	-	67, St. James' Street, S.W.
MARYPORT	-	-	Quintin Moore	-	-	Harbour House.
MIDDLESBROUGH	-	-	Mercantile Stores, Ltd.	-	-	Docks.
"	-	-	J. Durkin	-	-	Dock Street.
MILFORD HAVEN	-	-	W. H. Cowley	-	-	27, Hamilton Terrace.
NEWCASTLE-ON-TYNE	-	-	M. S. Dodds	-	-	61, Quayside.
"	"	-	S. A. Cail & Sons	-	-	29 & 31, Quayside.
NEWPORT, MON.	-	-	E. E. Williams	-	-	94, Dock Street.
NORTH SHIELDS	-	-	Jno. Lilley & Son, Ltd.	-	-	New Quay.
OBAN	-	-	Hugh Macdonald	-	-	"Times" Office, Esplanade.
PLYMOUTH	-	-	J. Blowey	-	-	23, Southside Street.
PORTSEA	-	-	Griffin & Co.	-	-	2, The Hard.
PORTSMOUTH	-	-	C. Groom, Ltd.	-	-	50, Broad Street.
QUEENSTOWN	-	-	T. Miller	-	-	1, Harbour Row.
SOUTH SHIELDS	-	-	T. L. Ainsley	-	-	Mill Dam.

SOUTHAMPTON	-	F. Smith & Son	-	-	23, Oxford Street.
"	-	Frank Moore, Ltd.	-	-	90, High Street.
SUNDERLAND	-	J. J. Wilson & Son	-	-	18 & 19, Hudson Road.
"	-	T. Reed & Co.	-	-	184, High Street West.
WEST HARTLEPOOL	-	A. Willings & Co.	-	-	73, Church Street.

SUB-AGENTS. (*Abroad.*)

ADELAIDE (S.A.)	-	A. E. Sawtell	-	-	Divett Street, Port Adelaide.
AMSTERDAM	-	L. J. Harri	-	-	Prins Hendrikhade, No. 90.
ATHENS	-	Eleftheroudakis & Barth	-	-	Place de la Constitution.
BOMBAY	-	Lawrence & Mayo	-	-	Esplanade.
BRISBANE (QUEENSLAND)	-	Watson, Ferguson & Co.	-	-	Queen Street.
BUENOS AIRES	-	Artur Reyes Lazo	-	-	Corrientes 435, Escritorio 3.
CALCUTTA	-	Jas. Murray & Co.	-	-	Government Place.
CAPE TOWN	-	W. Mercer & Co.	-	-	9, Loop Street.
"	-	Back & Hickson	-	-	23, Dock Road.
GIBRALTAR	-	James Molinary	-	-	Shipchandler, &c.
HAGUE, THE	-	Van Cleef Brothers	-	-	Libraries.
HAVRE	-	L. Croix	-	-	15, Rue de Paris.
HOBART (TASMANIA)	-	Walch & Sons	-	-	Merchants.
HONG KONG	-	G. Falconer & Co.	-	-	Queen's Road, Central.
LISBON	-	J. Garraio & Co.	-	-	Caes do Dodre, 84 1 <sup>o</sup> D.
LOURENÇO MARQUES	-	A. W. Bayly & Co.	-	-	Booksellers, &c.
MALTA	-	Collector of Customs	-	-	Custom House.
MARSEILLE	-	G. Viallet	-	-	8, Rue Beaveau.
MELBOURNE	-	J. Donne & Son	-	-	300, Post Office Place.
MONTREAL	-	Harrison & Co.	-	-	53, Metcalfe Street.
NEW YORK	-	John Bliss & Co.	-	-	128, Front Street.
NEWCASTLE (N.S.W.)	-	W. H. Sproull & Co.	-	-	99, Hunter Street.
PARIS	-	Augustin Challamel	-	-	17, Rue Jacob.
PEIREUS	-	H. C. Decavalla	-	-	Shipchandler.
PORT NATAL	-	Lewis J. Wilson	-	-	The Point.
PORT SAID	-	C. J. Vella & Co.	-	-	Shipping Agents.
PRINCE RUPERT (B.C.)	-	McRae Bros., Ltd.	-	-	P.O. Drawer, 1536.
QUEBEC	-	T. J. Moore & Co.	-	-	118 & 120, Mountain Hill.
RANGOON	-	Lawrence & Mayo	-	-	8, Phayre Street.
RIO DE JANEIRO	-	D. Norris	-	-	28, Rua da Assembleia.
SAINT JOHN (N.B.)	-	A. B. Smalley & Son	-	-	91, Prince William Street.
SAINT JOHN'S (NEW- FOUNDLAND).	-	Ayre & Son	-	-	231, Water Street.
SEATTLE (WASH.)	-	Max Kuner Co.	-	-	94, Columbia Street.
SHANGHAI	-	Walter Dunn	-	-	29, Kiangse Road.
"	-	Hirsbrunner & Co.	-	-	1, Nankin Road.
SINGAPORE	-	Hon. Sec. and Treasurer	-	-	Sailors' Home.
SYDNEY (N.S.W.)	-	Turner & Henderson	-	-	16 & 18, Hunter Street.
TOKYO (JAPAN)	-	Takata & Co.	-	-	Merchants.
TORONTO (CANADA)	-	Charles Potter	-	-	85, Yonge Street.
VALPARAISO	-	Tyrer, Holbrook, & Co.	-	-	153, Calle Blanco.
VANCOUVER CITY (B.C.)	-	Thomson Stationery Co., Ltd.	-	-	325, Hastings Street.
VICTORIA (B.C.)	-	Hibben & Co.	-	-	66, Government Street.

FEB 13 1900





**DO NOT REMOVE  
OR  
MUTILATE CARD**

UNIVERSITY OF MICHIGAN



3 9015 07341 6243

